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Celotex Corp. Reports Net Profit of $232,480

Earnings for Six Months Equal 59 Cents Per Share On 268,685 Shares of No Par Common After Providing for Dividends On 29,072 Shares of 5 Per Cent Preferred Stock—Compares With Loss In Same Period Last Year

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., June 15, 1936—The Celotex Corporation reported last week for the six months ended on April 30 a net profit of $232,480 after interest, depreciation and other charges, but exclusive of Federal taxes, against which the company had statutory provisions eliminating the requirement for any provision. This net profit, on the basis of stock outstanding at the beginning of the fiscal year, was equal to 59 cents a share on 268,685 shares of no-par common stock, after providing for dividends on 29,072 shares of 5 per cent preferred.

For the six months ended on April 30, last, net profit was $180,499, equal, after preferred dividends for the period, to 53 cents a share on the common stock, compared with a net profit of $51,980, or 6 cents a common share, in the preceding quarter.

These are the first reports for these periods of the new company:

For the six months ended April 30, last year, combined reports of receivers and trustees of the Celotex Company showed a net loss of $88,510 after depreciation, interest and amortization of debt, discount, and payment on account of services rendered of receivers and their counsel.

Net sales for the six months ended on April 30, were $3,310,199. In the first six months of last year, the company had net sales of $2,415,398.

Bradner Smith and Wroe Merge

While the business of W. E. Wroe & Co., has been almost entirely transacted by Bradner Smith & Co. since 1930, it was only last week that the latter concern completely took over the Wroe business toegther with the personnel of the Wroe organization. Bradner Smith & Co. will continue to handle all Wroe standard watermarks and private brands while former Wroe salesmen will also handle the Bradner line according to reports. The consolidation was an economy move and a natural development following a series of events beginning in 1929 when W. E. Wroe sold his majority interests in the thirty-five year old paper company to Bradner Smith & Co. For the past seven years directors of Wroe have kept the identity of the firm but the dissolution is now reported as complete with Wroe stockholders receiving Bradner Smith securities in return. Mr. Wroe left Chicago some time ago and is said to be engaged in fruit growing in the southwestern part of the United States.

Warren Bullock Discusses Imports

The Middle West Division of the Salesmen's Association of the Paper Industry got a chance last Monday to see just how much one of their "babies" had grown when Warren Bullock, manager of the Import Committee of the Paper Industry, discussed imports at the regular weekly luncheon meeting. The Salesmen's association has long been interested in the problems presented by imported products and it was gratifying to hear Mr. Bullock relate the way in which the matter is now being handled. The representative of the industry gave an illuminating report on the import situation indicating that the trend toward free trade and other developments were discriminating strongly against the paper industry at almost every turn. He warned the salesmen that a great deal of work must be done to change this trend if the paper industry were not to feel the serious consequences of uncurtailed importations. The Midwest Division also announced its second golf outing to be held at Bob-O-Link on June 26 with most of the salesmen wondering if Jack Hillyer would again put up a prize of three beautiful wood clubs for the lucky number holder. The Hillyer trophy at the initial outing was won by Courtney Reeves of the Allied Paper Company.

News of the Industry

Harold Knott, manager of the Chicago offices of the Eastern Manufacturing Company, returned to Chicago on June 6 after a two weeks' trip on the Pacific Coast during which time he visited most of the important cities on the western seaboard. Jack Burrus, Albemarle Paper Company, left on June 8 for a trip into the southwestern territory and with the announced purpose of taking in a part of the Texas Centennial Exposition while en route.

Chicago has two representatives on the recently announced directorate of the reorganized Great Lakes Paper Company, newsprint manufacturers. The two are L. E. Aldrich and J. W. McCurdy, the former being business

(Continued on page 27)

Outlook for Newsprint Paper Improves In Canada

General Advance In Market Values, Accompanied by Rumors of Impending Mergers of Leading Interests, Higher Prices for Second Half of Year, and Spot Market of $44 Per Ton In New York—Babson Report Optimistic

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., June 15, 1936—Substantial demand for newsprint bonds and stocks has been a feature of the stock market here during the past week, and this combined with a general advance in market values has been accompanied by rumors of impending mergers in the industry, higher newsprint prices for the second half of the year, and a spot market of $44 per ton in New York.

Color has been lent to these reports by a meeting of newsprint executives held in Montreal during the week, and by the prediction in Babson's current report of an early revision upward in the price of newsprint.

As regards the latter, one of the Montreal financial papers remarks: "Without attemping to argue that a higher price would not be an integral factor in the rehabilitation of the industry, an obvious deduction, we submit that unless the higher price is accompanied by new money for the rehabilitation of plant (as an economy measure to compensate for increasing costs of production), and a reorganization of bankrupt companies (to make for a more even distribution of tonnage), a moderate advance in selling price alone would be of little avail. A rise in the price of a commodity, unaccompanied by the basic economies of operation and internal cooperative harmony within the industry, merely serves to stimulate production elsewhere, and thus eventually makes for keener price competition."

Mergers Not Likely Before End of Year

As to the question of mergers, while newsprint interests undoubtedly are working with a view to achieving these and also with a view to securing a better price for their product, the attainment of either of these objectives before the end of the current year is remote. As to the spot market rumor, it is pointed out by those in close touch with the situation that, under existing conditions in the industry and with the contract system which prevails, a spot market of newsprint is more or less of a misnomer.

Consolidation Rumors

The rumor which has been most prevalent here has to do with the suggested amalgamation of Abitibi, Consolidated, Price Brothers and St. Lawrence. Such a consolidation, representing four of "the big five" in the Canadian newsprint field, would undoubtedly be a constructive factor, but the difficulties of bringing these companies together appear to be insuperable. More likely, as a result of present negotiations are two mergers — possibly Consolidated and Price Brothers being one and Abitibi and St. Lawrence another.

As to the question of newsprint prices, the general feeling seems to be that no improvement can be looked for till 1937, especially in view of the fact that the $41 per ton figure set by Great Northern covers the full twelve months of 1936.

The outlook for 1937 price depends on several factors, chief of which is whether consumption will continue to catch up with efficient productive capacity during the balance of the current year. In this connection the current monthly review of the Canadian Bank of Commerce points to the interesting fact that exports of Canadian newsprint to markets other than the United States have increased from 337,545 tons in 1929 to 523,050 tons in 1935. This gain of almost 200,000 tons in overseas consumption will be increasingly important in its effect upon the statistical position of the Canadian industry as consumption in the U. S. continues to grow. The lifting of receiverships from Price Bros. and Abitibi is another factor in the price outlook but is one that can be much more easily controlled. It is to be assumed that every effort will be made to effect the reorganization of these two major operators before the close of the current year in order that price negotiations may be facilitated.

Forests Closed Except to Pass Bearers

As a measure of protection against fire, the Quebec Ministry of Lands and Forests have closed the forests until November 15 against all who have not previously obtained a travel permit from the department, of its local representative.

The law providing for permits to travel on Crown lands during the summer months has been in force since 1925. The permit must be carried on the person and must be shown by the holder to any fire warden on request.

Hoberg Paper Files Loan

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, June 15, 1936—The Hoberg Paper Mills, Inc., of Green Bay, Wis., has filed under the Securities Act of 1933 for $900,000 of first mortgage 5 per cent convertible sinking-fund bonds, due on July 1, 1946, and 18,000 shares of no-par common stock, to be reserved for conversion.

Net proceeds are to be used first for the retirement of the balance of first mortgage 7 per cent sinking fund gold bonds outstanding and due on Feb. 1, 1937, of the Hoberg Paper and Fibre Company in the principal amount of $672,600. The balance will be devoted to the meeting of expenses of the company in connection with the sale of the securities and to increase working capital.

The bonds are to be convertible into common stock of the registrant.

Consider Brunswick for Paper Mill

According to the *News* of Brunswick, Ga., paper manufacturers of Ohio are considering establishment of a pulp and paper mill at or near Brunswick.

"Representatives of the company have paid several visits to this city for the purpose of completing their plans and negotiations," the *News* says.

It was announced recently that the corporation plans to erect a plant at Port St. Joe, Fla., but the *News* says "this in no way conflicts with the Brunswick plan.

"The corporation is one of the leading manufacturers of paper and paper board in the United States. It has plants in various sections of the country and in view of the trend of the paper manufacturers to the south, it is entirely logical that the company should seek another southern location," the *News* said.

WHY THROW AWAY

OUT OF EVERY SHEET

The area of the above "scrap of paper" in proportion to this page represents roughly the proportion of your production that goes to the sewer instead of into paper—unless you have a closed white water system. . . . Why not look into this matter of fibre loss? Whether it's large or small we'd like the chance to show you how quickly a Bird Save-All would pay for itself by turning this loss into a net profit. May we?

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Murray Bay Newsprint Paper Mill Reopened

President J. T. Donohue Announces Plant Has Resumed Operations After Approximately Two Year Shut-Down—Paper Mill Has Capacity of About 120 Tons Daily—Pulp Mill of Same Company in Operation Right Along

TORONTO, Ont., June 15, 1936—The newsprint mill of the Murray Bay Paper Company Ltd., at Murray Bay, which had been closed for about two years, has resumed operations, it was learned officially from J. T. Donohue, president. This will provide welcome employment throughout the region and many citizens of Murray Bay, Pointe-au-Pic, and Cap a l'Aigle are expected to find jobs with the re-opening of the mill, although it is not stated just what number of men will be taken on. The company's pulp mill at the same locality, it was pointed out by Mr. Donohue, has been in operation right along. The paper mill has a capacity of about 120 and 124 tons. A rumor in circulation was to the effect that powerful American-Hearst interests were negotiating to either build or operate the existing mill at Murray Bay, but it is understood that these interests are taking the output of the mill and thus making its re-opening possible.

May Lose Major Share of $200,000 Market

Canadian fine paper makers stand to lose all, or the major share of a $200,000 market in Australia, when the new Tasmania fine paper plant is brought into operation about a year from now. In an agreement which has been entered into with the State Government the company undertakes to spend not less than 200,000 pounds on the erection of buildings in the current year. The first unit will manufacture 15,000 tons of paper annually, or a daily output of approximately 50 tons. The classes of paper to be manufactured will be fine printing and writing papers. Last year Canadian companies marketed about 1,300 tons of book paper, having a value of $178,269 in the Australian market. The records of exports show that Australia has steadily increased its purchases, the dollar value of exports having increased about 200 per cent in the last four years.

Wallpaper Co. To List Shares

Special interest attaches to the annual statement of Canadian Wallpaper Manufacturers, Ltd., for the year ended April 30, 1936, in view of the fact that application will be made to list the shares on the Toronto Stock Exchange. Profits for the year amounted to $217,839, equal to $1.68 per share on the 129,246 Class "A" and Class "B" shares of no par value combined. Dividends declared by subsidiary totalled $498,090, from which was deducted $291,163, representing proportion thereof already included in undistributed profits account at April 30, 1935, leaving a balance equal to amount of earnings of subsidiary companies for the year of $206,927. Gross profits on goods manufactured and sold were $52,994, making a total of $259,995.

Provincial Retains Good Contract

Announcement from Port Arthur, Ont., that Provincial Paper Ltd., has been notified by the publishers that *Liberty* magazine will continue the policy of publishing a Canadian edition on Canadian-made paper, is confirmed by S. F. Duncan, head of Provincial Paper. *Liberty's* paper requirements in Canada are being manufactured at the mills of Provincial Paper, and the decision to continue publishing in the Dominion has been made notwithstanding possibilities of economy in taking advantage of the recent tariff changes giving United States magazines free entry into Canada. Present requirements for *Liberty's* Canadian edition are about 1,600 tons of paper annually, and on this one order the fine paper department of Provincial mill at Port Arthur is engaged for one day per week. Labor required to produce this amount of paper is about 14,000 man-days of eight hours each, and the manufacture involves the transportation of 3,896 tons of material in and out and the expenditure for Canadian materials of $33,000 per 1,000 tons. According to A. G. Pounsford, general manager, Port Arthur Division of Provincial, the Canadian edition of *Liberty* required 3,275 tons of paper during the past two years. All of this paper, with the exception of a small amount made at Mille Roches, has been manufactured at the company's Port Arthur mill.

Notes and Jottings

Pulpwood operations in Southern New Brunswick are the most extensive of any season in the past ten years. According to A. J. Lacroix, manager of the Port Royal Pulp and Paper Company, and the St. George Pulp and Paper Company, this year's cut will be extra large to fill heavier demands. The two companies of which Mr. Lacroix is manager have contracted for 71,000 cords of pulpwood, as against 13,000 cords last year. It is estimated that between 3,000 and 4,000 cords of pulpwood will be cut in St. John County and about 5,000 cords in King's County. About 10,000 cords will be cut in Charlotte County. Extensive operations are under way in other counties.

It is learned on good authority that active negotiations are still in progress between the Abitibi Power and Paper Company and the Anglo interests with a view to the acquisition and operation of the St. Anne paper mill at Beaupre by the latter corporation. It is stated that a big effort is being made to get the mill open and running within the next few months.

A contract has been awarded for a shipping room and storage building as part of expansion program of Hygrade Corrugated Products Ltd., 640 William street, London, Ont. The cost will be $40,000.

Spring drive of the Pigeon Timber Company in Northern Ontario, has started down the Kaministiquia River. Sixty thousand cords of pulpwood, destined for the Great Lakes Paper Company's plant at Fort William have started the long trip from the upper reaches of the river.

About 100,000 cords of sap-peeled pulpwood will be cut in the Thunder Bay district and supplied to the markets in Pennsylvania, Wisconsin and Michigan, C. W. Cox, M. L. A., announced in Fort William. Men are going into the camps now and shortly over 1,000 will be employed in the bush.

Taggart Bros. Elect Directors

[FROM OUR REGULAR CORRESPONDENT]

OSWEGO, N. Y., June 15, 1936—The annual meeting of the stockholders of Taggart Brothers Inc., was held this week at which the acts of the board of directors during the year were approved. The stockholders elected the following directors; Floyd L. Carlisle, William K. Dick, Roy K. Ferguson, H. Edmund Machold, R. B. Maltby, Carl B. Martin, Charles R. McMillen, Byron B. Taggart.

F I R S T I N T H E C O U N T R Y

SCULPTURED IN TIN BY L. L. BALCOM

UP and down the old Mississippi ranged the hustling packet ships of the last mid-century. Their captains found trade where trade had never been known before... and helped to build a vast inland empire of commerce. Just so in our modern mid-century is EBG building progress where progress was only imagined before. By ranging the frontiers of industry it is continually discovering new uses for that valuable product, Liquid Chlorine; revealing new methods and processes that open up a new empire of industrial activity, new opportunities for profit. In matters pertaining to Liquid Chlorine put your trust in EBG — pioneer producer of the product in America.

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EBG Liquid Chlorine

Kimberly-Clark to Erect Main Office Addition

New Three-Story Building, With Basement, Will Be Constructed of Brick, Steel and Concrete—Contract Awarded to C. F. Meyer & Sons Co.—President F. J. Sensenbrenner Announces Building Will Be Ready November 1

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., June 15, 1936—As another important step in its extensive improvement program, the Kimberly-Clark Corporation, Neenah, Wis., awarded a contract last week to C. R. Meyer & Sons Company of Oshkosh, Wis., for the erection of an addition to the main office building at Neenah. It will be three stories high, with basement, and will be of brick, steel and concrete construction. The structure will be "U" shaped, 85 by 105 feet in size.

F. J. Sensenbrenner, president, announces that the building will be ready for occupancy on or about November 1.

Ground was broken recently by the company for a five-story addition to its Lake View mill at Neenah, and the foundation is being completed.

Contract Awarded for New Reservoir

Construction of the reservoir on the Big Eau Pleine River in Marathon County, Wis., will be started immediately, following the awarding of a contract last week to the George W. Condon Company, of Omaha, Nebr. Announcement of the plans was made by George W. Mead, president of the Consolidated Water Power and Paper Company.

The reservoir is the first step in the Wisconsin Valley Improvement Company's plan to turn the valleys of the Big and Little Eau Pleine Rivers into reservoirs for the benefit of a uniform water power flow on the Wisconsin River, serving numerous paper mills. Completion is scheduled by January 1.

The contract calls for the building of a dam one mile long and thirty feet high. Two roads will be raised above the level of the new artificial lake twelve miles long, covering 7,333 acres of land. A total of 4,250,000,000 cubic feet of water will be impounded, adding 40 per cent to the capacity of the chain of 20 reservoirs built by the Improvement Company since 1907. The estimated total of the Big Eau Pleine contract is $325,000. The Consolidated company acquired approximately 12,000 acres of riparian lands before beginning construction, and is setting aside 1,000 acres as a public park on the artificial lake.

Safety Conference Successful

Safety efforts were given new impetus through the enthusiasm of the Wisconsin River Valley Safety Conference, held at Nekoosa, Wis., June 4. More than 300 industrial executives and safety engineers were present. F. H. Rosebush, mill manager of the Port Edwards mill of the Nekoosa-Edwards Paper Company served as general chairman, and J. J. Plzak, of the Consolidated Water Power and Paper Company, as secretary.

Conferences, discussions and a parade were held during the day, and the gathering closed with a banquet at Alexander gymnasium at Nekoosa. Voyta Wrabetz, of the Wisconsin Industrial Commission, served as toastmaster in the absence of John E. Alexander, president of the Nekoosa-Edwards Paper Company. Mr. Wrabetz pointed out in his remarks that there are 18,000 industrial injuries every year, and only collective action of this kind will bring the ultimate goal of wholesale reduction of this frightful toll.

W. C. Knoelk, assistant superintendent of schools at Milwaukee, Wis., and chairman of the Milwaukee Safety Commission, spoke at the banquet on "Man-Failure Prevention." Constant hammering is needed on safety even if it is "old stuff," he said. He paid tribute to industry as leading the way in the nationwide campaign of safety in all avenues, and remarked that while the primary motive was to reduce the high cost involved in accidents, industry had by no means overlooked the humanitarian side. A diagnosis of the cause of accidents, Mr. Knoelk said, reveals that "accident prones" incapable of safe action are not so much to blame, but can be attributed to "man-failure" among the average of us. A militant safety organization in every state is essential, he said.

Another speaker was George P. Hambrecht, director of the state department of vocational education. He urged that safety organizations telegraph President Roosevelt asking him to sign the $12,000,000 vocational school endowment bill, because it would mean that the safety program of the state's vocational schools "would be doubled and trebled in its effectiveness."

Leo Barrette, personnel manager of the Consolidated Water Power and Paper Company, led a discussion at the pulp and paper sectional conference. He urged "discipline enforcement at the top," beginning with the highest executives in a mill. That, followed by a policy of no partiality shown safety rule violators with the foremen the key enforcement officers of mill, and decisions in safety matters rendered "fairly and squarely," would lead to reduction of mill accidents.

Frank Taylor, of the Taylor Insulation Company, Merrill, Wis., was elected conference chairman for the coming year. Merrill was chosen as the 1937 conference city.

Cooperative Symposium Held

Starting last week and continuing through June 18, a cooperative symposium sponsored by the Technical Association of the Pulp and Paper Industry is in progress at the Institute of Paper Chemistry, Appleton, Wis. Approximately thirty technical experts from mills throughout the country are participating in an analysis of fiber estimation.

Last week was spent by the group in laboratory studies, and the current week was to be given to a discussion of the results of the study. The symposium permits the correlation of a mass of analytical data from which the group hopes to obtain information which will serve TAPPI in making recommendations concerning a standard procedure.

John B. Calkin, chairman of the TAPPI sub-committee on microscopical paper testing, is acting as chairman. R. G. MacDonald, secretary of TAPPI, is also assisting.

Facial Tissue Patent Granted

Charles A. Fourness, of the Kimberly-Clark Corporation, has been granted a patent for his invention of an improved method of making a tissue paper sheet suitable for facial and like uses. James T. Whelan was associated with him in the invention.

The method involves the conducting of a creped paper

sheet through a pressure zone which is not high enough in pressure to cause the paper to harden. Simultaneously, an all-over pattern is formed on the sheet. The patent was applied for in June, 1935 and was approved as to three features. It has been assigned to a Chicago concern.

News of the Industry

Fifteen executives and salesmen of the Dwight Brothers Paper Company, Chicago, were guests of the Gilbert Paper Company, Menasha, Wis., for two days last week. They were conducted on an inspection tour of the mill and attended an informal sales meeting. One morning was devoted to golf at the North Shore Country Club. T. M. Gilbert and R. G. Whale, of the Gilbert Company, were in charge of the arrangements.

Eleven degrees were conferred by Lawrence College on graduates of the Institute of Paper Chemistry, Appleton, Wis., at the commencement exercises last week. Degrees of Ph.D were given to Ward D. Harrison, Mason City, Iowa; James E. Foote, Delaware, Ohio; and Stephen I. Kukolich, Toltec, Colo. Master of Science degrees were conferred on: Earl B. Brookbank, Jr., Seattle, Wash.; William J. Foote, Jr., Appleton; Loren V. Forman, Ames, Iowa; Robert C. McKee, Arlington, Vt.; Martin J. Roberts, Palmerton, Pa.; John P. Weidner, Paxton, Ill.; Eugene Hughes Williams, Jr., New Bern, N. C.; and John C. Wollwage, Chicago, Ill.

Open house was held at Kaukauna, Wis., last week in honor of H. S. Cooke on his eighteenth birthday anniversary and the close of fifty years of residence in the city. Mr. Cooke became a clerk in the office of the former Fox River Pulp and Paper Company after his graduation from Ripon College. He later became superintendent of the city schools, but some years later returned to the paper industry as an executive of the Outagamie Paper Company. After it was acquired by the Patten Paper Company, Ltd., he was made office manager and held that position until his retirement last fall.

Minisink Paper Co. To Reopen

MINISINK HILLS, Pa., June 15, 1936—G. F. Shampanore, president and manager of the Minisink Paper Company, announces that he expected to have the mill running and producing paper within the next few weeks, giving work to approximately thirty-five men.

Commissioner D. J. Meehan, of Dutchess county, New York, has become associated with the company in the capacity of treasurer and he spent the past few days here with Mr. Shampanore going over the plant. He stated that the prospects are very good and that the company has some very fine orders.

The plant has been closed down for some time and there was much damage done during the spring floods but this has all been repaired. Much of the machinery located in the basement was coated with mud from the flood and all of the electric motors had to be completely overhauled. This has all been cleaned up now and it is hoped to have the mill in operation within the time mentioned.

Magnusol

The Magnus Chemical Company, 22 South Avenue, Garwood, N. J., has just issued an interesting circular describing Magnusol. This is a new and different product for the efficient and thorough cleaning of metal and other surfaces. It is a unique soap, soluble in either water or a solvent such as kerosene. It confers upon any solvent greatly improved penetration, solvency and cleaning effect.

Southern Kraft Corp. Files Registration

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 17, 1936—The Southern Kraft Corporation, of Mobile, Ala., has filed a registration statement under the Securities Act of 1933 with the Federal Securities and Exchange Commission covering $14,500,000 of First Leasehold and General Mortgage Bonds, 4¼ per cent. series due 1946.

According to the registration statement, the net proceeds from the sale of the bonds are to be applied as follows:

$298,554 to redemption on August 1, 1936, at 102 per cent. of $292,700 principal amount of Bastrop Pulp and Paper Company First Mortgage 15-year 6½ per cent. Sinking Fund Gold Bonds, due February 1, 1940, of which $20,100, principal amount are owned by affiliates:

$1,700,000 as follows: $1,582,759.50 to prepayment in full of the 5 per cent. notes (bank loan) of the corporation, aggregating that amount and payable serially from October 20, 1936 to July 20, 1938, and $117,240.50 to reimburse the treasury of the corporation for the reduction in bank loans on April 15, 1936 from $1,700,000 to $1,582,759.50;

$1,619,000 to the acquisition from International Paper Company, a parent company, of a like principal amount of Louisiana Pulp and Paper Company First Mortgage 7 per cent. Sinking Fund Serial Gold Bonds, which, after certain amendments thereto, and to the mortgage and trust under which they were issued, will be 5 per cent. First Mortgage Bonds, due January 1, 1950. Upon acquisition by the company, these bonds will be pledged under the indenture to secure the bonds being offered;

The balance, amounting to $10,382,446, will be applied to the retirement of the following bonds and notes of the company, owned by International Paper Company:

$8,682,634.35 to the retirement in full of $10,000,000 principal amount of First Mortgage Leasehold and Fee 5 per cent. Bonds, Series A, due October 1, 1961, of the corporation, owned by International Paper Company, to be retired at the above cost, exclusive of accrued interest;

$1,699,811.65 to the reduction of demand notes of the corporation, owned by International Paper Company, and aggregating $21,724,454.99.

The balance of the indebtedness to International Paper Company, together with accrued interest, making an aggregate of $22,466,081.84, is to be satisfied, it is stated, by the issuance of that company of $14,000,000 of income notes due 1947, and 59,000 shares of common stock of the corporation, at a stated value of $5,999,000, and the balance, amounting to approximately $2,467,081.84 will become paid-in surplus of the corporation.

The bonds are redeemable in whole or in part, at the option of the corporation, after 30 days' notice, at the following prices, plus accrued interest:

If redeemed on or before June 1, 1939—102½ per cent; thereafter and including June 1, 1940—102 per cent; thereafter and including June 1, 1941—101½ per cent; thereafter and including June 1, 1942—101 per cent; thereafter and including June 1, 1943—100½ per cent; and thereafter at 100 per cent.

The price to the public, the names of the principal underwriters, and the underwriting discounts or commissions are to be furnished by amendment to the registration statement.

R. J. Cullen, of New York City, is president of the corporation.

Union Bag Mill Operates Full Time

HUDSON FALLS, N. Y.—The factory of the Union Bag and Paper Corporation here is operating 24 hours a day.

Paper Box Manufacturers Association Elects

Harold S. Fuller of Bicknell & Fuller Paper Box Co., Boston Again Chosen President—Alan K. Schleicher, of F. J. Schleicher Paper Box Co., St. Louis, Mo., Elected Vice-President—W. H. Deisroth Reelected Treasurer

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., June 15, 1936—At the annual convention of the National Paper Box Manufacturers Association which was held recently in the Hotel Traymore, Atlantic City, the following officers were elected: Harold S. Fuller, Bicknell and Fuller Paper Box Company, Boston, Mass., re-elected president; Alan K. Schleicher, F. J. Schleicher Paper Box Company, St. Louis, Mo., vice-president; and Walter H. Deisroth, W. H. Deisroth Company, Philadelphia, re-elected treasurer.

Those elected to the directorate were: W. D. Lane, Eggers-O'Flyng Company, Omaha, Neb.; Charles Ruble, Standard Paper Box Corporation, Los Angeles, Calif.; A. K. Siler, G. A. Bisler, Inc., Philadelphia; James H. Hickman, Knoxville Paper Box Company, Knoxville, Tenn.; Charles K. Shaw, Shaw Paper Box Company, Pawtucket, R. I.; Clarence M. Owens, Shoup-Owens, Inc., Hoboken, N. J.

Paper Demand Active

With business in both fine and coarse divisions of the paper trade going along on an even keel, there is nothing new to report at this time. In the waste paper industry a better demand prevails for all grades, with, however, no improvement in prices. The paper mills are now running 70 per cent. of their capacity, which is a 10 per cent. gain over a very long period.

Paper Trade Association Activities

On Wednesday, June 17, there will be a luncheon meeting of the Board of Governors of the Paper Trade Association of Philadelphia at the Down Town Club. The second in the series of meetings to discuss the Questions and Answers sent out to the trade by William A. Hentz, chairman of the Merchandising Committee, will be held on Thursday at 'noon in the Down Town Club.

Paper and Cordage Outing Successful

That always fondly anticipated and well attended function of the Paper and Cordage Association—its annual outing—was held on Friday, June 12 at the Manufacturers Country Club, and attracted to the grounds a large, enthusiastic and representative delegation of members and their friends. Quite incidentally it also attracted much public attention. The journey to the Country Club at Oreland was made in a procession of a score or more autos which left Independence Hall at 11 A.M.

All the features of the association's outing at their best were presented by the committee headed by E. K. Lay. And the crowd was there, numerous and exuberant, to enjoy themselves to the fullest extent. After a very pleasant afternoon in the open, all enjoyed the dinner which was accompanied by very beautiful orchestral selections, thus affording a perfect day, to which there is applicable the truthful, even though hackneyed expression, "A good time was had by all." William H. Kilhour, president of the Quaker City Paper Company, who has a baritone voice of no mean quality, rendered several vocal selections that were very well received.

A solo was also sung by Fred T. Hufoal of the Huff Paper Company.

The results of the contests on the greensward were: 1st prize Schuykill Paper Company's Cup, and a permanent prize of a cocktail set to L. A. O'Neill of Paper Manufacturers, who had a low gross score of 79.

Prize of a silver pitcher was won by John G. Birle, American Forest Products Company, whose low net was 64.

Mrs. Doris E. Lewis, executive secretary of the Paper Trade Association of Philadelphia won a very attractive casserole for 1st Kickers Handicap prize.

3rd Kickers Handicap prize was also a silver cigarette case, won by Arthur B. Sherrill of the D. M. Bare Paper Company.

George K. Hooper, president of the Hooper Paper and Twine Company, and also president of the Paper and Cordage Association, won first prize for quoits, a very handsome brush set.

Second prize for quoits—a silver tray—went to I. J. Sheppard, Peerless Paper Company.

First prize for tennis—a brush set—was won by Norman Hall.

Second prize for tennis—a bon bon dish—was awarded George Frederick.

Among the unique features of this Outing was the straw vote which was taken by all those in attendance and which resulted in Governor Alf. M. Landon, G. O. P. nominee for President, defeating President Roosevelt.

Record Canadian Newsprint Exports

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., June 8, 1936—Canada not only continues, month by month, to surpass all records for similar months in previous years in the production of newsprint, but it now appears that for the fiscal year ending March 31 exports of newsprint exceeded in volume those of any previous year. For the twelve months the total exported amounted to 2,663,081 tons. The highest previous total for a twelve-month period was for the calendar year 1929, when exports amounted to 2,515,495 tons.

The figures as to exports and for the past ten years are interesting, for they show that while last year's exports exceeded those of 1927 by 781,216, the value was less by the huge sum of $32,560,715—a fact that explains the difficulties in which newsprint producers find themselves. The figures are as follows:

Calendar Year	*Tons*	*Value*
1927	1,881,865	$123,222,094
1928	2,206,588	141,103,527
1929	2,515,495	148,865,648
1930	2,332,510	133,370,932
1931	2,008,240	107,233,112
1932	1,776,764	82,966,169
1933	1,838,105	69,200,515
1934	2,414,274	82,503,659
Fiscal year March 31		
1935	2,392,523	82,147,844
1936	2,663,081	90,761,379

Good Demand for Paper Experienced in Boston

Various Grades of Fine Paper In Persistent Request—Prices Unchanged—Volume of Kraft Wrapping Paper Sales Satisfactory for Season—Box Board Section Continues Quiet—Paper Stock Division Reported Dull and Flat

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., June 15, 1936—A substantial volume of business was transacted by paper wholesalers last week, judging from statements made by jobbers. Among those handling fine paper such comments as "fairly good," "pretty good," and "pretty brisk" were made. In wrapping paper, it was stated that business was "not too bad," "fairly good," and "going along well, pretty good." At a house handling both fine and kraft paper, it was given out that sales were very good and a larger tonnage has been placed for the last two weeks and that some of this might be due to anticipation of strengthening in prices. Kraft is scheduled to advance ⅛ cent a pound for all conversion uses on July 1. Box board continued quiet.

The paper stock market was reported as "dull and flat," even quieter than the previous week, with a tendency to "ease up." This condition is said to have developed earlier in the season than usual. Manufacturers, in many cases, and particularly in some grades, are simply out of the market. The tendency of the paper stock dealer is to pay lower prices. European shippers persist in holding prices $5 to $10 above the market. Many rejections have been made on dark cottons, Turkish rags and other merchandise sent to this country. As yet, however, prices of paper stock have been unchanged from those of a week ago.

Paper Trade Outing Well Attended

The regular June meeting, with which was combined the annual outing of the Boston Paper Trade Association, was held last Monday at the Charles River Country Club, Newton Centre, Mass., with a good attendance, including a number from New York, New York State, and New Hampshire. Many arrived in good season in the morning for golf, which was played all day, while the other outdoor sports took place in the afternoon. Luncheon was served at the Locker building from 11:30 on.

Dinner, at which there was not a dull moment, was at 6:45 o'clock at the club house, followed by the business meeting, with President F. Bendel Tracy presiding. A vote of thanks was given to John Vivian for the use of the club. The following were elected to regular membership in the association: V. R. Hahn, New York, N. Y., and Joseph J. Levis, Lawrence, Mass., both proposed by James C. Campbell. Elected to "limited" membership were James Richard Carter, Nashua, N. H., proposed by Norman Harrower, George F. Morrison, Cohoes, N. Y., and James N. Weems, Jr., Brookline, Mass., both proposed by Willard H. Loud.

Handsome and valuable sterling silver prizes were awarded to the winners at golf, with W. Edwin Porter, Jr., capturing for the second time the Association Championship Cup, which must be won three times to become the permanent property of the winner. The fifteenth year's play for the cup took place at this outing. Winners were as follows: Class A Handicap, 20 and under, first gross, Bruce Crane; first net, E. Edwin Porter, Jr.; second net, L. Ranson; third net, John R. Whitney. Class B Handicap, 21 to 28, first gross, W. J. McLellan; first net, Paul Poinier; second net, Maurice Park; third net, Ed Hughes. Class C Handicap, 28 and over, best selected nine holes, Walter J. Raybold. Kicker's Handicap, Herbert C. Fowler. Guests's Handicap Tournament, Gorham Bliss and Henry F. Savage. The golf committee was composed of W. J. McLellan, chairman, E. D. Bement, both of whom spoke in connection with the awards, Nelson Feeley, Maurice A. Park, W. Edwin Porter, Jr., and John R. Whitney.

W. Gardner Very, chairman of the sports committee, announced the awards for the events. Winners of the horseshoes contest, under charge of Royal P. Teele, were: First, E. T. Simpson, flower-bowl; second, R. P. Teele, vase. In this contest, H. W. Gordon, E. T. Simpson and C. Frederic Wellington made one ringer each. Putting, under charge of William C. Ross, first, Frederic W. Main, flower-bowl; second, T. Charles Casey, vase. Bowling, under charge of Hubert W. Lockhart, first, Kenneth L. Moses, siphon; second, W. Gardner Very, pepper and salt set. This bowling varied from the usual, in rolling a ball uphill to hit an erect iron bar. The baseball game, under charge of Paul M. Beach, was played by teams captained by Allen Helfrich and Ed Sullivan, in a five-inning contest, won by the Helfrich nine, by a score of 14 to 7. A box of cigars was awarded the winners and a carton of cigarettes to the losers. The mystery contest, with W. G. Very in charge, was won by, first, Paul M. Beach, electric clock, and second, Harry C. Thayer, lemon dish and fork. Prizes in this contest were given to those who wrote the most in a given time in the following: Nos. 1 to 26, the alphabet backwards, and Constantinople with the left hand.

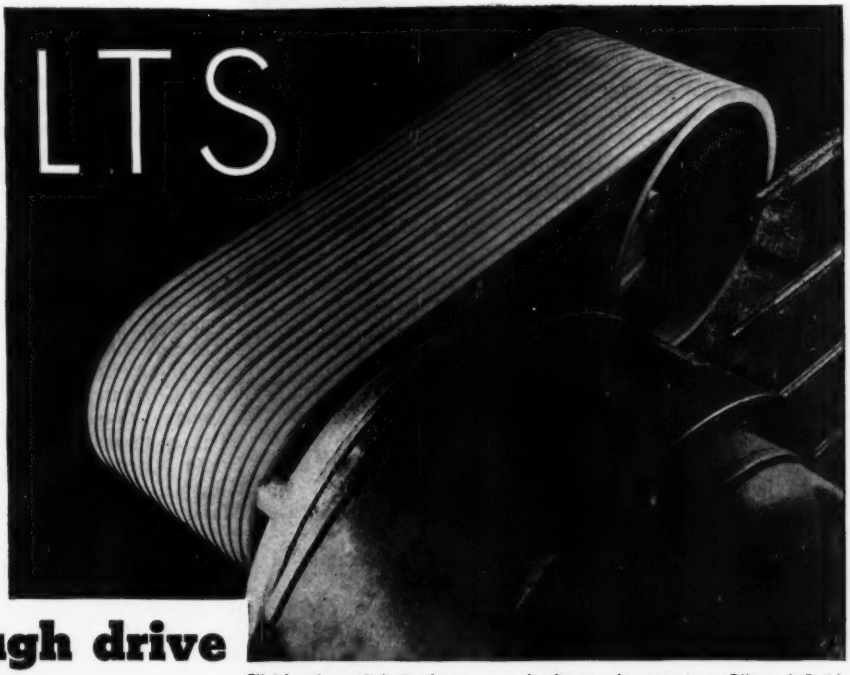
News of the Industry

Carter, Rice & Co., Corp., has begun to handle a new line of paper by Nation Wide, known as Brite-Opaque, a moderate-priced sheet of good strength, with a brilliant shade of white and a very high degree of opacity, obtained by the use of titanium. It is especially recommended for jobs printed on both sides. There is no objectionable show-through when Brite-Opaque is used. Because of the extra opacity, Brite-Opaque can be used in a lighter weight than other papers in many instances and a substantial saving effected.

Winthrop L. Carter, president and general manager of the Nashua Gummed and Coated Paper Company, Nashua, N. H., and president of the New England Council, has returned from a trip half way around the globe, most of it by plane, with plenty of ideas to develop New England as a recreation ground. He arrived June 11, after a non-stop flight from the West Coast and a few weeks in Hawaii. He will present his ideas to the quarterly meeting of the council at Rockland, Me., June 26 and 27. His trip began with a flight to Tucson, Ariz., thence to Texas, and to Guaymas, Mexico, for deep sea fishing. Returning to Arizona, he left when the temperature approached 100 degrees, and, after visits to scenic spots of the West, arrived in Los Angeles. He sailed for Honolulu May 1. He will leave in two weeks for Europe to attend the wedding of his son in London, July 18.

Visitors to Boston last week included Mr. Levine, of S. Schapiro & Sons, Baltimore and New York, and Mr. Apt, of Apt & Co., of the country of Poland.

GILMER V-BELTS



take this tough drive as "just another job"

Click! — the switch is thrown . . . simultaneously seventeen Gilmer I C 44 V-Belts seat themselves snugly in the sheaves of this big blower drive . . . sharing the load equally, picking it up gently, absorbing *every* shock!

THE Taggert Valley Glass Works, Washington, Pa., is the scene of this example of Gilmer superiority. This heavy-duty multiple V-drive operates a large blower from a 150 h. p. motor. Subject to sudden shocks, it is far too tough for the average belt . . . but to Gilmer V-Belts it is "just another job." Here, as on thousands of other V-drives, Gilmer V-Belts are demonstrating their efficiency and economy.

Gilmer BELTS

However severe your belting requirements may be, you will find that Gilmer V-Belts "measure up." Give them a try, on any V-drive, and you'll see why most maintenance men say—"they're the best belts made."

L. H. GILMER COMPANY, Tacony, Philadelphia

Manufacturers OF COMPLETE LINE OF POWER BELTING

V-belts · Kable Kord Roll and Endless Flat Belting · Planer Belts · Speedage Endless Fabric Belts · Cone Belts · Roving Frame Belts · Moulded Rubber Belts · Winder Belts · Spinner Belts · Refrigerator and Washing Machine Belts · Conveyor Belts · Round Roll and Endless Fabric Belting · Endless Belting · Endless Cotton Belts · Laundry Feed Ribbons

SPECIALISTS IN QUALITY BELTS SINCE 1903

Mrs. W. K. Farr Speaks at New England Section TAPPI Meeting at Winchendon, Mass.

The New England Section of the Technical Association of the Pulp and Paper Industry met Friday and Saturday of last week at Winchendon, Mass. The meeting opened Friday evening with a dinner at the Toy Town Tavern, at which William Foote of B. F. Perkins & Son Company, presided in the absence of the chairman.

Structure of Cellulose Membranes

The outstanding feature of the meeting was a talk given by Mrs. Wanda K. Farr of the Boyce-Thompson Institute for Plant Research, Inc., Yonkers, N. Y., on the "Formation and Structure of Cellulose Membranes".

Mrs. Farr described new methods for identifying cellulose by means of their optical and chemical properties. Slides were shown demonstrating the actual structure of cellulose and how the units of which the fiber is composed react to the various chemical reagents. She also described the structure and form of the cellulose units and the interesting material identified as pectin that cements the units together.

The effect of polarized light and x-ray diffraction patterns by which the cellulose is shown to be doubly refracted, giving different color effects, is an additional aid to the determination of the structure of cellulose.

The microscopic technique described will be of inestimable value to the chemist and paper technician and will aid in giving a better explanation for the puzzling reactions that sometime take place with cellulose and some of the degrading substances and their products.

Further work along these lines to be done in the near future was indicated by Mrs. Farr and opens to question some of the concepts regarding the structure of cellulose and their reactive products.

An interesting discussion followed Mrs. Farr's talk.

Golf and Bridge Prizes

Golf was played both Friday and Saturday with prizes going to the following.

MEN

Kickers—TAPPI Trophy	A. L. Perry
Kickers—Superintendents' Cup	Francis Gillispie
Kickers—Salesmen	Lester Crouse
Kickers—Toy Town	S. G. Stapley
Low Gross	F. H. Schneider
2nd Low Gross	John Alcarez
Low Net	F. S. Couchman
2nd Low Net	R. J. Quinn
Highest Score	J. F. Inderdohnen
Most Sevens	P. J. Hemphill

LADIES

Low Gross	Mrs. F. H. Schneider
Highest Score	Mrs. Ralph Carter
Kickers	Mrs. George Carroll

Bridge prizes were awarded to the following:

CONTRACT

First Prize	O. F. Lane
Second Prize	Mrs. A. F. Cosby

AUCTION

First Prize	Miss Ella Norris

Those Who Attended

Among those present were the following:

A. G. Cardwell and O. F. Lane, Krebs Pigment and Color Company, Newark, N. J.; W. L. Foote, B. F. Perkins Company, Holyoke, Mass.; Chester Landes, Fitchburg Paper Company, Fitchburg, Mass.; W. P. Richardson, A. D. Little, Inc., Cambridge, Mass.; J. E. Doyle, American Writing Paper Company, Holyoke, Mass.; W. A. Nivling, Huron Milling Company, Boston, Mass.; S. D. Hellberg, American Writing Paper Company, Holyoke, Mass.; H. S. Leonard, Merrimac Chemical Company, Boston, Mass.; J. H. Burgen, American Writing Paper Company, Holyoke, Mass.; William Anderson, ———, Holyoke, Mass.; William Lamory, American Writing Paper Company, Holyoke, Mass.; R. J. Quinn, Mathieson Alkali Works, New York City; F. H. Lovenberg, Mathieson Alkali Works, Providence, R. I.; J. E. Hughes, Krebs Pigment Company, Newark, N. J.; Lester Crouse, Penick & Ford Company, Springfield, Mass.; A. F. Bailey, DuPont Company, Providence, R. I.; Joseph Mulligan, Grasselli Chemical Company, Boston, Mass.; W. O. Thompson, Krebs Pigment and Color Company, Newark, N. J.; A. L. Perry, Krebs Pigment and Color Company, Boston, Mass.; Harold Lavallee, Clinton Company, Springfield, Mass.; F. L. Cassidy, American Writing Paper Company, Holyoke, Mass.; L. M. Booth, Booth Chemical Company, Elizabeth, N. J.; Francis Gillispie, American Writing Paper Company, Holyoke, Mass.; William J. Burke, General Dyestuff Corporation, Providence, R. I.; T. F. Flaherty, American Writing Paper Company, Holyoke, Mass.; Cornelius Stapley, Chemical Paper Company, Holyoke, Mass.; Mr. and Mrs. A. B. C. Drew, Pairpoint Company, New Bedford, Mass.; Mr. and Mrs. W. O. Johnson, ———, Woronoco, Mass.; Mr. and Mrs. F. S. Couchman, American Aniline Company, Boston, Mass.; Mr. and Mrs. P. J. Monell, ———, Boston, Mass.; Mr. and Mrs. D. K. Bartlett, West Dudley Paper Company, West Dudley, Mass.; Mr. and Mrs. G. H. Spencer, E. D. Jones Company, Pittsfield, Mass.; Mr. and Mrs. Philip Philbin, John Campbell Color Company, Boston, Mass.; Mr. and Mrs. John H. Browne, Chemical Paper Company, Holyoke, Mass.; Mr. and Mrs. Randall Doughty, Fitchburg Paper Company, Fitchburg, Mass.; Mr. and Mrs. Edward McDonnell, Fitchburg Paper Company, Fitchburg, Mass.; Mr. and Mrs. P. J. Hemphill, General Electric Company, Pittsfield, Mass.; Mr. and Mrs. F. H. Schneider, Hampden Color and Chemical Company, Springfield, Mass.; Mr. and Mrs. S. G. Stapley, Chemical Paper Company, Holyoke, Mass.; Mr. and Mrs. A. J. DeCouagne, Schapiro & Sons, Holyoke, Mass.; Mr. and Mrs. P. S. Bolton, Clinton Company, Boston, Mass.; Mr. and Mrs. A. F. Cosby, American Writing Paper Company, Holyoke, Mass.; Mr. and Mrs. Ralph Carter, ———, Springfield, Mass.; Mr. and Mrs. R. E. Kilty, Staley Company, Springfield, Mass.; Mr. and Mrs. F. H. Leonard, Marble-Nye Company, Providence, R. I.; Mr. and Mrs. J. P. Kennedy, American Writing Paper Company, Holyoke, Mass.; Mr. and Mrs. A. G. Caldwell, Knox Felt Company, Holyoke, Mass.; Mr. and Mrs. George Carroll, American Writing Paper Company, Holyoke, Mass.; Mr. and Mrs. L. A. Thompson, Papermakers Chemical Company, Holyoke, Mass.; John Alcarez, Krebs Pigment and Color Company, Newark, N. J.; John F. Inderdohnen, Bristol Company, Springfield, Mass.; Mr. and Mrs. E. Blackstead, Ambassador-Sieger Corporation, Boston, Mass.; Mr. and Mrs. J. F. Wright, National Aniline Company, Boston, Mass.; Miss Helen U. Kiely, American Writing Paper Company, Holyoke, Mass.; Mrs. Wanda K. Farr, Boyce-Thompson Institute, Yonkers, N. Y.

Indianapolis Reports Specialties Active

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., June 15, 1936—Little change was seen in the local paper market during the last week. Demand is about the same as it has been for the last month, with summer specialties being the notable exception, having increased in volume enormously. Really warm weather for the first time during the summer is responsible for this condition. Demand is beyond that of last year at the same time on these specialties, but the total volume thus far for the year shows little improvement, due to a late start. At the present time some jobbers are finding it rather difficult to supply the demand. Retailers, they say, delayed buying until the last minute and due to the fact that they had virtually no hold-over stocks and that demand jumped to mid-season volume almost immediately, they all were caught short-handed. Paper towels, specialties of all kinds and tissues are most wanted.

The fine paper demand is about the same as it has been. Books and covers are moving rather steadily with the volume slightly better than a year ago. Ledgers also are having a steady sale. A good demand continues for bags of all kinds with particular emphasis on demand for large bags for the cleaning trade. Local shopping bag manufacturers report a good demand for these items, better in fact than a year ago.

A wide list of consumers is reported now for containers of all kinds. Customers that were nearly out of the market for five years have begun buying again and the situation is particularly bright. Much the same is true of the box manufacturers.

Demand for all building papers continues active. Roofing and insulating papers are particularly wanted. More roofing paper will be sold this year than at any time since 1928, according to jobbers and the wholesale stocks are light.

Paper stock demand is about the same. Mills are making inquiries but actual buying is being restricted.

To Run Convention Special

Many of those in New York and adjoining states are going to the superintendents' convention at Grand Rapids on the Wolverine of the New York Central, leaving Grand Central Station, New York City at 5:30 P.M., Standard Time, Tuesday, June 23, arriving at Grand Rapids, Michigan, at 10:12 A.M., Wednesday. The Wolverine leaves Albany at 8:43 P.M.; Schenectady, 9:13 P.M.; Utica, 10:34 P.M.; Syracuse, 11:39 P.M. A sleeper will be attached to this train at Buffalo at 2:25 A.M., Wednesday, June 24. This sleeper will be opened to passengers at nine o'clock Tuesday evening. A train leaving Boston at 3:20 P.M. makes connections with the Wolverine at Albany at 8:23 P.M. The fare on the Wolverine is $49.60 round trip, lower berth $5.50 one way; upper $4.40; section $7.70; compartment for one $15.50; drawing room for two or three, $20.00. Car 57 on the Wolverine will carry quite a delegation. Make your reservations immediately.

Herbert E. Harmon Ill

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., June 15, 1936—Herbert E. Harmon, secretary of Knowlton Brothers Inc., is critically ill at his home with heart trouble. Mr. Harmon, who is 82 years old, recently suffered a severe attack which is believed to have been brought on by overwork. His many friends look for his recovery although his condition is described as serious.

CELOTEX CORP. REPORTS PROFIT

(Continued from page 13)

manager of the *Chicago Daily News*. It is reported that a ninth director is to be elected to represent the newspaper publishers who have contracted to purchase their newsprint supply from the reorganized company for a period of ten years.

The Hobart Paper Company held its annual golf outing at the Olympia Fields Country Club on Wednesday afternoon, June 10. A big turnout of customers and suppliers featured the day's outing which is a yearly event sponsored by the Chicago sales offices of the Hobart organization. Sales Executives McDonald and Jones played a big part in making the arrangements.

Chicago paper executives and their sons have been invited to participate in the annual Fathers and Sons Banquet of the Graphic Arts organizations to be held at the Medinah Club on June 16. Special entertainment and talks by the "dads" will feature the event sponsored jointly by the Printers Supplymens Guild of Chicago and the Chicago Club of Printing House Craftsmen. Fine paper executives and their sons will be invited guests for the evening.

With a number of meetings being held this week, Chicago paper executives are not particularly anxious to specify exact market conditions except to say that the underlying strength is still there and that demand seems to be better than the normal seasonal trend. Groundwood meetings to be held in Chicago this week are expected to have some effect as are meetings of other groups scheduled to be held in the East. Kraft and newsprint markets here continue to be the best in demand while the other grades are only fair with inquiries of a spotty nature. Fine papers reported little change during the week with bonds and ledgers retaining virtually the same position. Books were in slightly better demand, as were covers. Groundwoods were fair. The waste paper market was comparatively slow with some lowering of the old folded news reported as this grade dropped into the same price level as mixed papers. The drop was reported at about a dollar a ton, bringing about an f.o.b. price of approximately $8.50.

Twenty-two mills and thirty-six executives were represented at the meeting of the Kraft Paper Association held at the Drake Hotel in Chicago early last week. One of the important items of business was the announcement by the secretary, S. M. Hudson, of the chairmen and personnel of the standing committees of the Kraft paper group. These are as follows: Finance, W. H. Anders; Specialties, T. K. Davis; Grocery Bags, L. C. Anderson; Import, W. H. Anders; New Uses, C. R. McMillen; Trade Customs, H. O. Nichols,; Gumming Industries contacts, T. K. Davis; Distributors Committee, J. L. Stille; Envelope Paper Committee, J. R. Miller and Tire Wrapping Committee, B. B. Stringfellow, Jr.

Expanding business in Chicago is reported as a major reason for the removal of warehouse and branch offices of the Chemical Paper Manufacturing Company and Crocker-McElwain Company to new quarters at 208 South Jefferson street.

Tarentum Paper Mills Get RFC Loan

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 17, 1936—Authorization of a loan of $25,000 was made during April by the Reconstruction Finance Corporation to the Tarentum Paper Mills, of Tarentum, Pa., according to announcement just made.

John Leggett 75 Years Old

[FROM OUR REGULAR CORRESPONDENT]

TROY, N. Y., June 8, 1936—The firm of John Leggett & Son recently observed the 75th anniversary of its founding. The business was started by John Leggett in 1865 and some time later his son, Joseph A. Leggett was taken into the firm. The firm then became John Leggett & Son and was incorporated as such in 1903. The concern some years ago maintained plants in this city, Cohoes and Hudson. The Troy plant, however, was destroyed by fire several years ago and since that time manufacturing has been confined to the Cohoes and Hudson plants, although the general offices are located in this city. Some years ago the company also operated a box board mill at Middle Grove in Saratoga county. The company today is rated among the largest producers of paper boxes in this section. Present officers of the concern are W. K. Brown, president, and Arthur J. Burch, treasurer.

Regarding the oldest employes of the Leggett concern there are Edward J. Rooney and Henry Busher, whose combined service amounts to 92 years. Mr. Rooney, who is 65 years old, has been in the employ of the concern since 1889 while Mr. Busher became connected in 1891. In reality these men have been connected with the trade considerably longer as they were employed by other concerns prior to starting with the Leggett firm. Now in his 78th year Mr. Busher has been conected with the business for 54 years.

E. I. du Pont de Nemours & Co. Not Connected with St. Joe Paper Co.

In announcing the new kraft liner board mill to be built by the St. Joe Paper Company at Port St. Joe, Fla., in a recent issue of the PAPER TRADE JOURNAL, the venture was referred to as a du Pont project and the company as a du Pont interest. These references, however, it has been pointed out, may lead to the interpretation that the St. Joe Paper Company is an interest of the E. I. du Pont de Nemours & Co., of Wilmington, Del., but such is not the case. The Almours Securities Company, Inc., which organized the St. Joe Paper Company, is affiliated with the estate of the late Alfred I. du Pont and is in no way connected with E. I. du Pont de Nemours & Co. Alfred I. du Pont was at one time associated with the du Pont Company, but his connection with it was severed in 1916 and his business enterprises since that time have been entirely removed from any association with that company. It may be seen, therefore, that by no stretch of the imagination may it be assumed that E. I. du Pont de Nemours & Co. is in any manner connected with the St. Joe Paper Company venture or that the du Pont Company is going into the pulp and paper mill business.

Soundview Pulp Co. To Expand

The Soundview Pulp Company proposes an immediate $2,100,000 investment in a 60 per cent plant expansion by adding 3,500 tons to the monthly capacity at the plant of the company at Everett, Wash., making it 9,500 tons a month. If the plan is approved 20,925 new shares will be offered present holders in the ratio of one for four held at $50 a share as against the current market of around $55. It is also proposed to sell two series of notes aggregating a million dollars for capital purposes in connection with the expansion. The notes will probably be sold to private institutional buyers and will include $500,000 of 4s redeemable at par over five years and an equal amount of 5s redeemable at premium up to 102 over six years.

Simpson & Morehead 65 Years Old

[FROM OUR REGULAR CORRESPONDENT]

TROY, N. Y., June 15, 1936—The Simpson & Morehead Paper Company recently observed its 65th anniversary here and today it is rated among the most prominent in this section. The manufacture of paper boxes and its related lines really had its origin in this city in the Hughes & Simpson box factory which was erected in 1872. The business flourished and the firm laid the foundation for the manufacture of paper boxes for the use of manufacturers of collars, cuffs and shirts in addition to other lines. This line of business expanded to the extent that hundreds of people were given employment the year around, prior to the inset of the depression.

The firm of Hughes & Simpson was organized by George Hughes and Ephriam Simpson. The president of the present concern entered the employ of the company at the age of 14. Following the death of Mr. Hughes the firm was continued by Mr. Morehead and Mr. Simpson. At the present time Mr. Morehead is the only surviving member of the original firm. He is president of the company and Charles Hart is vice president. When operating at peak the company employed 150 persons. Plants were also operated at Albany and Mechanicville, the latter being sold some years ago. Among the veterans at the plant are Thomas Perry, employed for 30 years; John Shaeffer, 40 years; Charles Klopsh, 35 years, and Peter Dean, 40 years.

Gardner-Richardson Salesmen Meet

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, June 15, 1936—Salesmen of the Gardner-Richardson Company, Middletown, who distribute products of the local paper concern in all sections of the United States, held their annual convention in Middletown, starting Thursday of the past week and continuing until Saturday.

The representatives came from the sales office in most of the larger cities between New York and St. Louis. Improved business conditions were reported and there were encouraging reports relative to the future of the trade.

Colin Gardner, vice-president of the company, presided over the sales sessions. Among the speakers was J. L. Ferguson, of the J. L. Ferguson Company, Joliet, Ill.

Luncheon sessions were held at the Hotel Manchester for the visitors of whom there were more than 50 in attendance.

On Friday the salesmen were guests of the Gardner-Richardson Company at the Wayne Golf Club in Cincinnati. Points of interest in the Miami Valley were visited and the paper mills inspected.

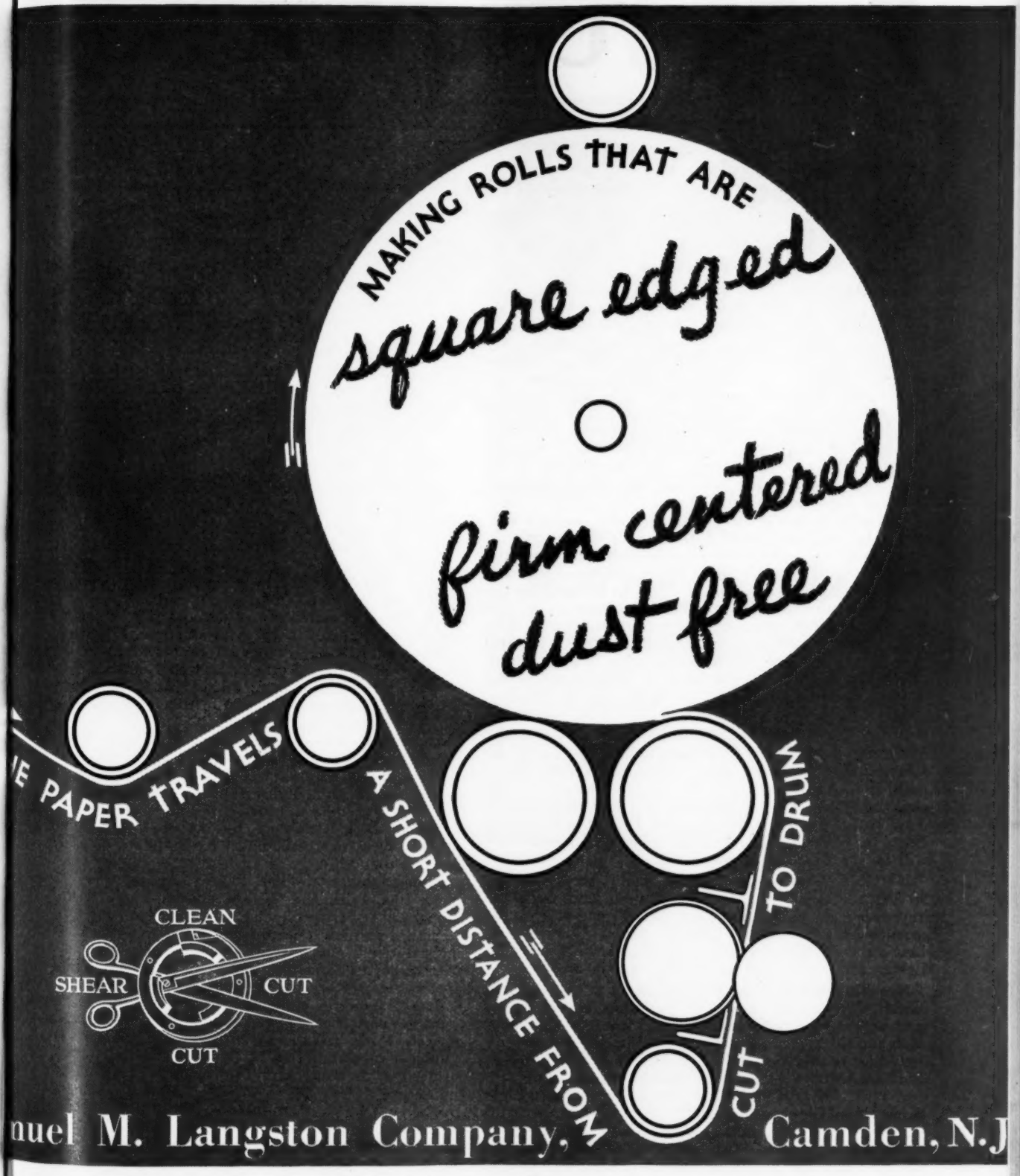
Stevens & Thompson Changes

The Stevens & Thompson Paper Company announces from its New York office, 205 East 42nd street that "Frank R. Nichol, our representative who has been covering the Metropolitan New York district, has been transferred to the New York State and Pennsylvania territory. This is in line with our sales expansion policy and incidentally a promotion for Mr. Nichol.

"J. N. Mullally, who has recently joined our sales staff, will represent us in the Metropolitan New York district.

"Both of these men have had considerable experience in the paper business and are well posted on merchandising and present day paper problems."

LANGSTON SLITTERS



AND ROLL WINDERS

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Charleston, S. C.—The West Virginia Pulp and Paper Company, 230 Park avenue, New York, N. Y., has awarded general contract to the Morton C. Tuttle Company, 31 St. James avenue, Boston, Mass., for construction of new pulp and paper mill on Cooper River, Charleston, previously referred to in these columns, and superstructure is scheduled to begin at early date. Plant will consist of several one and multi-story buildings for production of kraft liner stocks, including pulpwood storage units, digester department, machine division, finishing units, storage and distributing buildings, with power house, machine shop and other mechanical departments. Initial units will have a rated output of 250 tons of liner board per day and are estimated to cost close to $5,000,000, with machinery. At later date, it is proposed to construct additions and install equipment to double capacity noted. Plant will have facilities for employment of about 300 persons for initial operations. Arrangements have been made with municipality for necessary water supply and a bond issue of $1,000,000 is being provided by city for this purpose, to include construction of a water tunnel, pipe lines and other facilities to deliver water to the mill on the basis of 15,000 to 25,000 gallons per day, with source of supply at point on the Edisto River.

Rapid City, S. D.—C. L. Christ, Scottsbluff, Neb., operating a local plant for production of special insulating fiber products, using chemically-treated wood pulp, is planning early establishment of a new branch plant at Rapid City, where site will be selected soon. New plant will be one-story and is reported to cost close to $30,000, including equipment. Present mill will be continued as heretofore.

Hartford, Conn.—The Rourke Eno Paper Company, 58 Allyn street, has work under way on alterations and improvements in building, for which general contract recently was let to the Allyn-Wadhams Company, 15 Lewis street. No estimate of cost has been announced. Lester Beach Scheide, Inc., Hartford, is architect.

Neenah, Wis.—The Kimberly-Clark Corporation, North Commercial street, is awarding miscellaneous contracts for work in connection with new five-story mill addition, recently referred to in these columns, including reinforcing steel to Concrete Steel Company, St. Paul, Minn.; structural steel to the C. Hennecke Company, Milwaukee, Wis.; cement and materials, to Home Fuel Company, Neenah. General contract was awarded previously to the James Leck Company, 211 South Eleventh street, Minneapolis, Minn. Structure will be located at company Lakeview mill, and will be used in part for storage and distribution. It will cost in excess of $100,000, including equipment.

Vancouver, Wash.—The Columbia River Paper Mills plan early rebuilding of one-story mill unit recently destroyed by fire, used for storage and distributing service. Loss estimated close to $20,000, with equipment. E. J. Carey is manager at plant.

Green Bay, Wis.—The Hoberg Paper and Fibre Company, manufacturers of tissue, crepe and other paper stocks, fiber specialties, etc., has arranged for bond issue of $900,000, for general financing and other purposes, including increase in working capital. Joseph M. Conway is president and general manager.

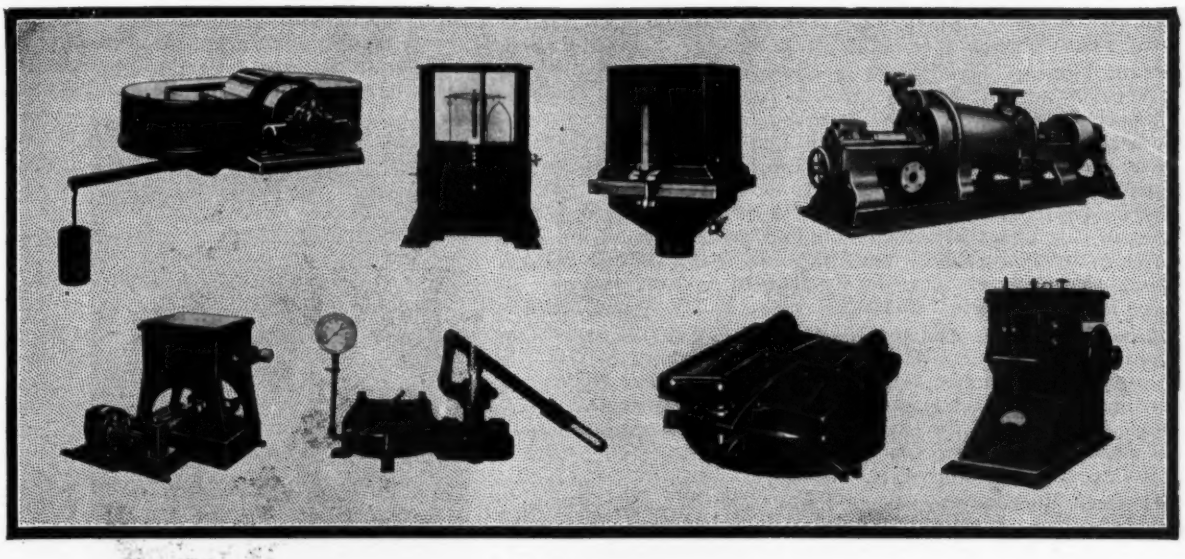
Crossett, Ark.—A number of contracts are being let for work in connection with new local pulp and paper mill of the Crossett Lumber Company, including an award for brick and masonry to Carter Lyon Company, Memphis, Tenn. The Rust Engineering Company, Clark Building, Pittsburgh, Pa., general contractor for project, has begun work on steel frame superstructures for different units and will push to completion at earliest date. A group of eight or more buildings will be erected for different mill departments. Plant will be given over to production of kraft paper stocks and will be equipped for initial output of 150 tons per day. Entire project will cost close to $4,000,000, in which amount financing has been arranged. Hardy S. Ferguson & Co., 200 Fifth avenue, New York, N. Y., are consulting engineers.

Richmond, Va.—The Albermarle Paper Manufacturing Company is carrying out an expansion and improvement program at its Brown Island Mill, used for the production of kraft paper stocks. A contract has been let to the Century Sprinkler Corporation, 305 Graham street, Richmond, for installation of a sprinkler system in new mill unit. No estimate of cost has been announced.

Philadelphia, Pa.—The Paper Manufacturers' Company, Inc., Fifth and Willow streets, manufacturer of industrial paper products, will proceed with superstructure for new one-story addition to paper-converting plant, for which general contract was recently let to the Turner Construction Company, 420 Lexington avenue, New York, N. Y. It is reported to cost over $60,000, including equipment.

New York, N. Y.—The American Tarso Corporation of New York, recently organized to manufacture decalcomanias and kindred products, will take over and succeed to the American Tarso Company, 420 Lexington avenue, New York, with plant at 444 Twelfth street, Brooklyn, N. Y., manufacturer of similar specialties. Expansion will be carried out in paper-converting facilities. New company is a subsidiary of the Consolidated Lithographing Corporation, with executive offices at 1013 Grand street, Brooklyn, N. Y., which also controls the Consolidated Decalcomania Corporation, Em-

This illustration shows pictures of the Beater, Drying Oven, Sheet Mould, Jordan, Flat Screen, Hydraulic Press, Hot Plate and Size Tester. Other items include Washer Cylinders, Couch Rolls, Fractionating Screens, Clay Erosion Tester and Bleachability Tester.



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pire State Building, New York, and other paper-converting interests. J. A. Voice is president of parent organization.

Beaver Falls, Pa.—The Armstrong Cork Company, Eighth avenue and 27th street, manufacturer of corkboard products, insulating board, etc., is considering plans for new addition to plant, estimated to cost over $100,000, including equipment. Work is scheduled to begin at early date.

Heath, Mont.—The United States Gypsum Company, 300 West Adams street, Chicago, Ill., manufacturer of wallboard products, etc., has approved final plans for new branch plant at Heath, and will begin superstructure at early date. General contract has been let to the James Leck Company, 211 South Eleventh street, Minneapolis, Minn. It will be one-story, 58 x 422 feet, estimated to cost about $110,000, including machinery. A portion of structure will be used for storage and distribution. Company engineering department will be in charge of equipment installation.

Philadelphia, Pa.—Philadelphia-Carpenter Container Corporation, 2150 East Huntingdon street, manufacturer of fiber containers, fiber drums, etc., has leased floor in building at Venango street and Kensington avenue, and will use for expansion. Company is affiliated with the Carpenter Container Company, Inc., 147 Forty-first street, Brooklyn, N. Y.

Montreal, Que.—Consolidated Lithograph Manufacturing Company, Ltd., 800 Parthenais street, has plans under way for new one-story addition to paper-converting plant, and will begin superstructure at early date. Cost over $75,000 with equipment.

New Companies

New York, N. Y.— The Beacon Envelope Company, Inc., has been chartered with capital of $20,000, to manufacture and deal in commercial envelopes and kindred paper products. New company will take over and operate organization of same name, with headquarters at 31 West Twenty-first street.

Los Angeles, Cal.—The Royal Paper Company has filed notice of organization, with offices at 1371 West 24th street, to deal in paper products of various kinds. W. Benoit, address noted, heads the company.

Sweden and Finland Plan Extensions

WASHINGTON, D. C., June 17, 1936—The reconstruction of the Munksjö sulphite mill at Jonkoping, Sweden, has been completed, according to a recent report from Commercial Attache Charles E. Dickerson, Jr., and work on the extension of its sulphate mill is under way. The increased output of both sulphite and sulphate pulp will be used by the company in the manufacture of kraft paper and leatherboard, which at present amount to approximately 30,000 metric tons and 5,000 metric tons respectively.

Reports in the local press indicate that chemical pulp manufacturers in both Sweden and Finland are planning on new extensions and plant improvement. In Finland many extensions are said to be contemplated and in Sweden several mills are improving their plant equipment. The latest news is that Mo & Domsjo A/B, one of the largest manufacturers of sulphite and sulphate in Sweden, will soon considerably increase the sulphate production at its Husum mill. This mill was built in 1916-1918, and modernized and enlarged in 1926 and 1934. The present annual output of the company amounts to about 105,000 metric tons of sulphite and 60,000 metric tons of sulphate pulp.

R. H. Scanlon Leaves Powell River

Robert H. Scanlon, for a long number of years prominently connected with the Powell River Company, Ltd., whose great newsprint mill is located at Powell River, B. C., announces the severance of his connection with that company as of June 1. Mr. Scanlon first joined the company in 1910, in the early spring of which year he went to Powell River at the beginning of the construction work on the mill. After the mill had been built, he remained in active management and operation of the plant until 1931

ROBERT H. SCANLON

as assistant resident manager. Thereafter he traveled extensively for the company, making market surveys in the Orient and on the Atlantic and Pacific Coasts of the United States.

Mr. Scanlon's plans for the future are not completely determined as yet, although he is making tentative plans to establish a newsprint sales organization of his own. His present offices are at 405 Montgomery street, San Francisco, Cal.

New Paper Mill Planned for South Africa

WASHINGTON, D. C., June 17, 1936.—Arrangements have been initiated between the South African Government and local paper interests for the establishment of a new paper manufacturing enterprise within the next eighteen months, according to a report to the Commerce Department from Assistant Trade Commissioner F. J. Cunningham, Johannesburg. The mill will be located at some point in the Eastern Transvaal, it is pointed out.

It is estimated that 750,000 cubic feet of Transvaal grown timber will be provided the new mill annually from the State-owned plantations, thus eliminating the importation of pulp for the enterprise. Pine logs, of a type not suitable for mining timber, will serve as the chief source of supply for the pulp mills, the report states.

The main output of the proposed mill will be kraft paper. Cement bags, now in great demand owing to the growth of the Union's cement industry, will absorb a large proportion of the local paper output. Strong kraft, instead of hessian, is now being used for these bags because it offers the additional advantage of being waterproof.

Approximately forty skilled white workers and several hundred natives will be employed when the new paper mill begins operations, according to the report.

Don't Be An Ostrich, Mr. Paper Maker!

Pull your head out of that hill of sand which is the daily routine of your own mill. Look around! See what the rest of the paper makers are doing with the help of their friends in the allied industries.

You can learn a lot in three days at Grand Rapids, Michigan, June 24, 25, and 26, when the Seventeenth Annual Convention of the American Pulp and Paper Mill Superintendents Association will be held at the Hotel Pantlind in conjunction with a pulp and paper exposition in the magnificent Civic Auditorium adjoining the hotel.

The very latest developments in pulp and paper mill practice and equipment will be reviewed in papers presented by recognized authorities.

Ample time will be allotted for general discussion of the subjects treated.

Special group meetings will give superintendents and other production executives an opportunity to learn something new on matter of direct, practical value to their own mills.

Outstanding personalities of the industry as well as speakers of national prominence will address the convention.

Entertainment and sports features of the highest order, with special provisions to make the occasion most enjoyable for the ladies.

A comprehensive exposition will present working models, drawings, photographs and literature on all that is new in the way of pulp and paper mill equipment and processes.

Every pulp and paper mill executive can profit by attending this convention and exposition.

Send in your reservations at once to the Hotel Pantlind, Grand Rapids, Michigan.

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FUTURE MEETINGS

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Summer International Meeting in Canada, August 3 to 7, Montreal, Quebec, The Saguenay. Details may be obtained from the secretary, R. G. Macdonald, 122 East 42nd street, New York.

NEW ENGLAND SECTION, Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Nonotuck Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION, Technical Association of the Pulp and Paper Industry—fourth Friday of each month at the Engineers Club, Philadelphia, Pa.

KALAMAZOO VALLEY SECTION, Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park-American Hotel, Kalamazoo, Mich.

AMERICAN PULP AND PAPER MILL SUPERINTENDENTS' ASSOCIATION, Annual convention, Grand Rapids, Mich., June 24-26, 1936.

HEADS YOU WIN, TAILS I LOSE

In the trade agreement which was recently concluded with France and which has just become operative the United States has reduced duties in 51 paragraphs of the tariff act, covering approximately 90 items. Many of the items are broad classifications. A majority of these reductions in duty range from 30 per cent to 50 per cent. The items on which the United States has reduced duties account for over 33 per cent of our imports from France in 1935. In addition the United States has entered into a number of other commitments. One of these is an agreement not to impose quotas on any product on which a reduction of duty is granted that is not now subject to a quota, unless at the same time the domestic production of the article is regulated.

What has France done? The American Tariff League answers:

France has reduced 19 rates of duty. Exports from the United States to France affected by these reductions amount to 3 per cent of our exports to France in 1935. Several of these reductions are nominal. Prunes are the most important export on which duties were reduced. The duty was reduced from 166.4 francs per 100 kilos to 165 francs per 100 kilos on one classification of prunes, and from 124.8 francs to 123 francs per 100 kilos on the other. And, the French reserve the right to increase any of these duties on the first of any calendar quarter.

Another section of the agreement is devoted to listing some items on which France will maintain the existing rate of duty. Exports of items under this caption amounted to slightly less than 5 per cent of our total exports to France in 1935. But, the French Government reserves the right to increase any of these duties on the first of any calendar quarter. The French have also agreed that they will not impose any quotas on such of the above articles which are not now subject to quota, unless they at the same time undertake to regulate and control domestic production or price.

The French tariff structure provides for a minimum and maximum duty, and in many cases an intermediate rate. The French Government has agreed to extend to other non-specified imports from the United States the minimum rates of duty. This provision specifically omits a list of approximately fifty items and the French Government is at liberty to increase any of these minimum rates at will.

Quota concessions are granted on 44 products. Thirty-eight of these are in the form of a supplementary quota. That is to say, a quota for imports from the United States already existed and the French Government granted a supplementary quota on top of the existing quota. But, the French Government reserves the right to change this supplementary quota on the first of July of any year commencing in 1937. And furthermore, as we interpret the agreement, the French Government has not obligated itself to preserve the basic quota that existed at the time the agreement was signed beyond the promise that they will give the United States a proportionate share of whatever basic quota exists. To illustrate: A supplementary quota of 502 quintals (110,671 lbs.) on electric refrigerators was granted by France. The annual quota existing at the time the agreement was signed provided for the entry of 8,498 quintals (1,873,469 lbs.) from the United States. Under the agreement, the provision for entry of 502 quintals of electric refrigerators must stand until July 1, 1937, but there is nothing to prevent the French Government, if they so desire, to reduce at any time the allotment of 8,498 quintals to any figure, however small, provided only that the United States receives a proportionate share of whatever world quota they choose to adopt. It should be added in fairness that the French Government has agreed not to increase the present ordinary customs duties on these products on which quotas have been granted, EXCEPT that it reserves the right to increase the duty at the end of any calendar quarter.

A major difference between the tariff policy of France and that of the United States is that in the United States at present time practically no imports are on a quota basis, while the bulk of the French imports are so regulated. By the use of a quota system the nominal increase of imports that is permitted may take place without upsetting the domestic price structure. The reason for this is the fact that if the quantity is strictly limited and known, there is little competitive pressure in the market to force sales. Where duties are reduced and no quotas are set, then it is likely that with an increase in importations competitive pressure will force price concessions in the domestic market.

In connection with the reservations that have been made by the French Government concerning the majority of the concessions which they have made in the agreement, it is necessary to add that provision is made in the agreement for discussion with the United States and for "compensatory modifications" in the agreement if necessary. It is also provided that if France chooses to exercise these powers to increase duties or reduce quotas established by the agreement and no satisfactory compensatory understanding can be reached, the whole agreement may be cancelled. Practically speaking, it is not likely that the United States would exercise this latter privilege in the event of the French Government exercising their right to increase duties or reduce quotas. The practices of the French Government in the last few years suggest they are likely to make a few modifications at a time. The seriousness of these modifications will probably not be taken as sufficient justification for cancelling the agreement. All of which means that unless the Government of the United States is willing to sit back and see what few concessions they received whittled away, they will have to embark on the European tariff policy of constant bargaining and tinkering with their tariff rates.

It is with profound regret that, says the League, we see in the French agreement the probability that the United States will be drawn into a position of emulating European tariff policy. We view any such tendency with great concern. The constant changing of tariff duties, the imposition and adjustment of quotas which have characterized the European trade control activities of the last decade, have not only caused a tremendous amount of friction, but they have impeded trade to an inordinate degree. The United States Government in all its history has never followed a foreign trade policy so disastrous to the establishment and maintenance of international trade and good will as that which is currently pursued by a number of European countries. BUT we have taken a long stride in that direction with the conclusion of the French agreement.

Union Bag Gets Heavy Pulp Shipments

[FROM OUR REGULAR CORRESPONDENT]

HUDSON FALLS, N. Y., June 15, 1936 — Several boat loads of foreign pulp consigned to the Union Bag and Paper Company were received this week at the Fort Edward terminal and motor trucks are being used in conveying the shipments here. The unloading of the boats was started immediately and other shipments of the imported product are expected during the summer. The company is obtaining most of its pulp from Sweden and shipments have been extremely heavy in recent years.

To Make Bamboo Pulp in Philippines

WASHINGTON, D. C., June 17, 1936—Organization of a company in the Philippine Islands to manufacture bleached pulp from bamboo is nearly completed. Syndicate members will be given a chance to subscribe to the extent desired, but if full amount necessary is not subscribed by them public subscriptions will be accepted. The company is to manufacture pulp only, which will be exported to the United States and to other foreign markets.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association:

COMPARATIVE MONTHLY SUMMARIES

Month	1936	1935	1934
January	76.1%	65.8%	.....
February	77.9%	70.0%	.....
March	76.0%	70.5%	.....
April	82.3%	70.0%	.....
May	81.3%	69.4%	.....
June	.....	72.3%	.....
July (b)	.....	67.8%	.....
August	.....	70.9%	.....
September (c)	.....	75.0%	59.4%
October	.....	75.6%	64.7%
November	.....	75.3%	61.7%
December (a)	.....	74.3%	62.1%
Year	.....	71.2%	.....

COMPARATIVE WEEKLY SUMMARIES

CURRENT WEEKS, 1936		CORRESPONDING WEEKS, 1935	
*May 9	81.6%	May 11	69.1%
*May 16	82.1%	May 18	70.7%
*May 23	82.5%	May 25	68.4%
*May 30	78.7%	June 1	68.9%
*June 6	80.3%	June 8	70.5%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting, Current Weeks				
Ratio Limits	May 9, 1936	May 16, 1936	May 23, 1936	May 30, 1936	June 6, 1936
0% to 50%	76	76	77	92	64
51% to 100%	259	258	252	228	181
Total Mills Reporting	335	334	329	320	245

* Subject to revision until all reports are received. These data exclude (a)—Christmas Day, (b)—Fourth of July, (c)—Labor Day.

PAPERBOARD OPERATING RATIOS

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours", were as follows:

1934	1935	1935	1936
September . 62%	January 61%	July 59%	January 61%
October ... 63%	February .. 67%	August 65%	February .. 67%
November .. 56%	March 67%	September . 69%	March 68%
Dec. (a) ... 53%	April 61%	October 76%	April 70%
	May 61%	November .. 70%	May 68%
	June 65%	December .. 60%	

Week ending June 6, 1936.....65%

Paper Firms Accused of Price Fixing

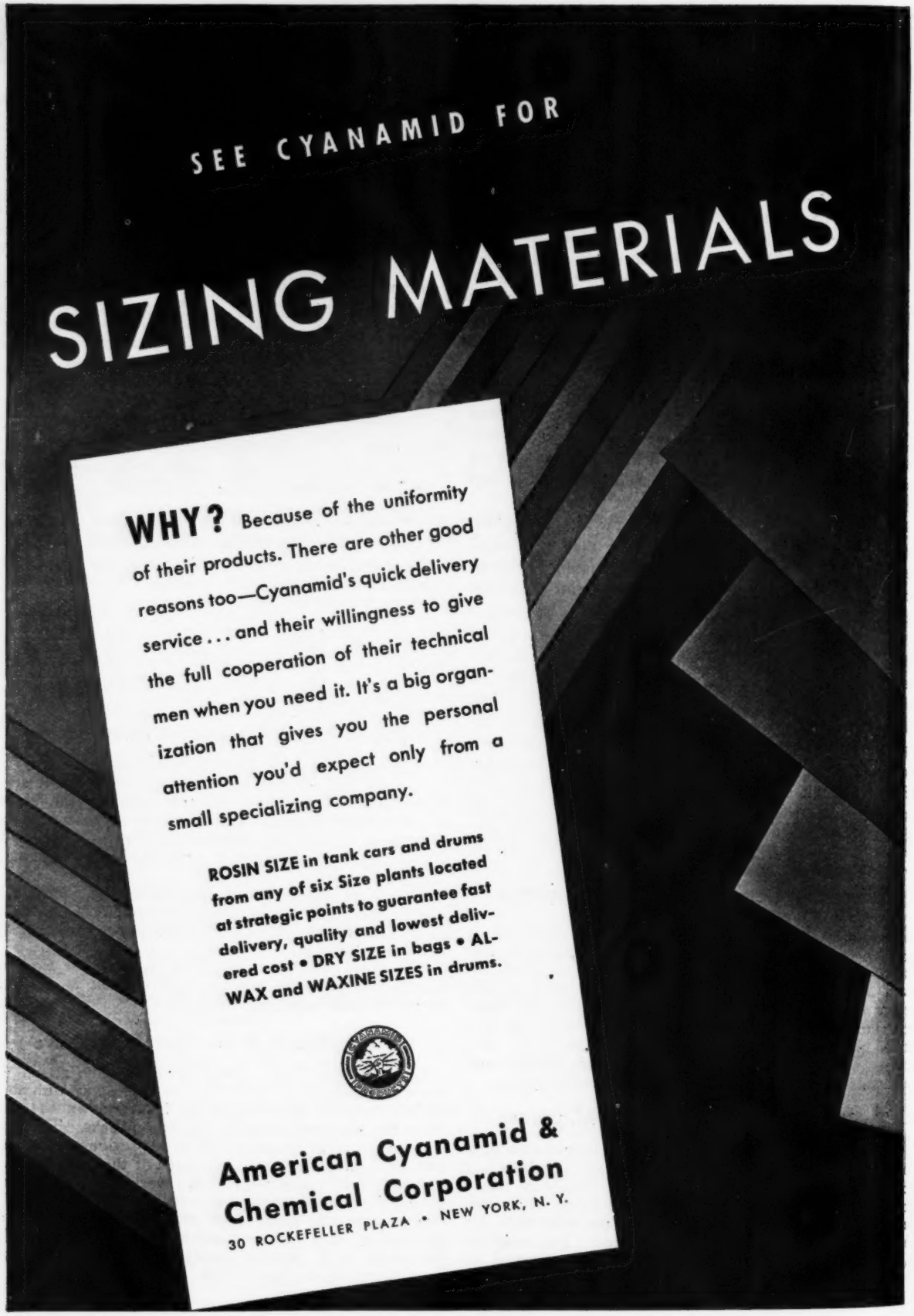
According to a press dispatch from San Francisco, Cal., fifty-eight paper companies operating in Western states and Pacific islands were ordered today by the United States Circuit Court of Appeals to show cause why they should not be held in contempt for disobeying an order prohibiting price fixing and combination in restraint of interstate trade.

The court instructed the companies all affiliated with the Pacific States Paper Trade Association to appear in court October 13. Virtually all major companies of the Coast are included.

The order was sought by the Federal Trade Commission, which has been warring against what is called an extensive paper combine since 1923.

Finch, Pruyn & Co. Start Log Drive

GLENS FALLS, N. Y., June 15, 1936—The annual log drive of Finch, Pruyn & Co. is now under way with about 32,500 cords of pulpwood being floated down the river from the Newcomb tract in the Adirondacks. The drive this year is about the same size as in previous years. Experienced lumberjacks are in charge of the drive which is expected to be completed late this week. The company is among the few concerns in this section which continue to obtain pulpwood needs from the Adirondacks and the preserve at Newcomb is rated highly, it being said that the timber is of superior quality to the imported product used by numerous paper firms.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We hope we'll see you at the 17th Annual Convention of the American Pulp and Paper Mill Superintendents' Ass'n, to be held in Grand Rapids, Mich., June 24-26.

Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Pulps

Pulp for Viscose Rayon. Papier-Ztg. 60, No. 53: 916-917 (July 3, 1935).—The author criticizes the statement of recent articles dealing with the manufacture of viscose pulps. He contradicts the assumption that only wood grown in very cold climates is suitable. Practical hints for cooking and bleaching are given and the importance of suitable, i.e., pure water and very thorough washing operations is emphasized.—C.J.W.

Increasing the Alpha-Cellulose Content of Sulphate Pulp. Audun Möller. Kgl. Norske Videnskab. Selskab Forh. 7:161-163 (1935); C. A. 29:6052.—When a sulphate pulp is treated wt 20° with chlorine water at concentrations of 50-200 grams chlorine per 100 grams dry pulp, the curve of chlorine absorption becomes asymptotic after 30 minutes at a pulp concentration of 20 grams per liter. When a pulp treated with 10 grams chlorine per 100 grams pulp is treated with concentrated sodium hydroxide at ratios of 60 grams per 100 grams dry pulp at pulp concentrations of 250 grams per liter, after washing the pulp contains 96-97 per cent of alpha-cellulose (dry basis), whereas the raw material contained 86-87 per cent alpha-cellulose, and the yield is about 86 per cent. Such pulp still contains 0.4 per cent lignin. Tests were made to determine if additional caustic treatment would reduce the lignin content further. It is necessary to use 60-80 grams sodium hydroxide per 100 grams dry pulp to maintain high alpha-cellulose content, but retreatment did not reduce the lignin content. Residual lignin must be chlorinated to render it soluble.—C.J.W.

The Use of Pulp with Higher Moisture Content in the Manufacture of Viscose Silk. W. I. Iwanoff, Zellstoff Papier 15, No. 2: 57 (Feb., 1935).—The fact that pulp for viscose silk manufacture should have not more than 5 per cent moisture was investigated and it was found that pulp in the slush form mercerized in one-third of the time. This procedure would necessitate a different type of apparatus for mercerization which is described.—J.F.O.

Short or Long Cook for Pulp Used in the Manufacture of Viscose Silk. Franz Huter. Zellstoff Papier 15, No. 2:57-58 (Feb., 1935).—A saving of time of 25 to 30 per cent means a decrease in yield of only 3 to 4 per cent by using the short cook over the long. The quality of the pulp is satisfactory for the manufacture of viscose silk and some of its chemical qualities such as ash and copper number are more satisfactory.—J.F.O.

Effect of pH Upon the Freeness of Chemical and Groundwood Pulps. E. C. Lary and D. S. Davis. Paper Industry 17: 249-250 (July, 1935).—Graphs are given in which freeness is plotted as a function of pH for a number of sulphite, soda sulphate and groundwood pulps. The slower sulphite, soda and kraft stocks were considerably more sensitive to change in pH than the freer pulps of the same nature. With sulphites, the freeness-pH curves pass through maxima at a pH value of about 5.4; with soda and kraft the maximum points are less sharp but occur between pH values of 5 and 6. The groundwood data are extremely erratic but show clearly that there is a rapid change in freeness between pH values of 4.0 and 4.4, and that there is a slower but distant freeing effect as the pH value inceases from 4.4 to 9.0.—A. P.-C.

Treatment of Pulp. James L. McLellan assignor to Hollingsworth and Vose Co. U. S. pat. 2,008,142, (July 16, 1935).—Sulphate pulp, cotton or hemp fibers, are mercerized by immersing and dispersing in a 12 to 15% caustic soda solution (preferably previously heated to a temperature somewhat below the boiling-point). The ratio of solution to fibers is preferably relatively low. The mixture is agitated for several hours without further heating, whereupon the charge assumes a dry, crumbly condition somewhat resembling cornmeal. After washing free from reagents, it is made into sheets that are characterized by high porosity.—A. P.-C.

Process of Treating Cellulose Fibers. Fredrich Olsen and Frederick R. Seavey assignors to The Cellulose Research Corp. U. S. pat. 2,007,341 (July 9, 1935).—Purified wood pulp or other cellulosic fiber to be nitrated is saturated with liquid (conveniently water), placed in a high pressure chamber, and subjected to steam under 500 to 1000 lbs. per sq. in. for a period varying from 5 to 60 seconds. On suddenly relieving the pressure, the fibers are disrupted and reduced to a condition that facilitates washing and neutralizing after nitration.—A. P.-C.

A Survey of Pitch Troubles in the Manufacture and Use of Sulphite Pulp*

By Otto Kress[1] and Lamar A. Moss[2]

Abstract

When alcoholic solutions of natural spruce resin were mixed with water or pulp suspensions, the resin was found to be dispersed uniformly as very fine particles. This suspension exhibited the same colloidal phenomena which are characteristic for sulphite pitch in paper mill stock. This means was therefore used to prepare pitchy pulp for laboratory investigation.

A study of the iodine, acid, ester, and saponification numbers of rosin, pitch, and the portions of these which were soluble and insoluble in petroleum ether gave an interesting insight into the effect of oxidation and heating on these materials. Rosin gave a slightly higher iodine number than pitch and, as would be expected from its lower molecular weight as compared with the fatty acids of pitch, it had a much higher saponification number. The portion of pitch insoluble in petroleum ether had a still higher saponification number, since it was chiefly natural resin acids of lower molecular weights. This fraction contained a large portion of the esters present in the pitch.

Prolonged heating of any of the above samples in contact with air at 105 deg. C. produced a very great decrease in iodine number, which approached what seemed to be a minimum number around 50. Excluding air during the heating restricted this decrease so that iodine numbers around 100 were obtained. Although both treatments produced about the same hardening effect, reduction in solubility was greater in the presence of air.

By aging in air, the petroleum ether solubility was found to decrease with time. The rate of decrease fell off gradually, but even after twenty-four days the decrease from day to day could be detected.

Aqueous solutions of oxidizing agents did not affect the petroleum ether solubility to any great extent but gave a brittle, light-colored extract.

The alcohol extracts from pulp held at 155 deg. C. for the last thirty minutes of the cook were slightly more viscous than those from a regular cook. In a flotation test, a sample cooked under the former conditions gave no stickiness whatever in the foam.

No favorable effects were found from treating the raw wood with formaldehyde under pressure at high temperature, nor from adding formaldehyde in the digester, blow pit, or beater. The presence of formaldehyde in the digester interfered seriously with the normal removal of lignin.

Pitch stained with Sudan III showed up very clearly against a dark field in the microscope.

The emulsions formed by adding alcoholic pitch solution to water or stock were stable while left at rest, but gave deposits on the walls of the stirrer and the plates in the beater as a result of agitation and the effect of air bubbles.

In pebble mill beating, troublesome pitch was found to form a deposit on the shot and walls which could be dissolved with alcohol, dried, weighed, and used as a measure of pitch trouble to be expected.

Hollander beating action caused the accumulation of pitch on the surface of the stock where it was collected along with the foam and some fiber by brass plates suspended so as to drag on top the circulating stock. The rate of deposition was found to be faster in a suspension of pulp, previously extracted with dilute hydrochloric acid and washed thoroughly with distilled water to remove all hardness, than where hardness was present. Strips of fourdrinier wire along the sides of the beater below the surface of the stock were found to collect a small amount of pitch, which would serve as a very strong indication that the resinous material present would lead to pitch trouble.

The laboratory stirrer was used to find the effect of pH and other agents on suspensions of pitch in stock. Mere acidity gave little improvement, but an acid emulsifying agent of the nature of waste sulphite liquor was effective. Alum precipitated the pitch on the fiber in the same manner as in the regular sizing operation with rosin. Sodium thiosulphate was found to give some hardening effect, but did not seem to be sufficient. Bentonite gave considerable improvement.

Re-dispersing the pulp in washing gave better removal of pitch and slower removal of waste acid than straight flow. Gardinol assisted in the removal of pitch, but residual Gardinol left behind would be the source of foaming trouble later on in the operation. Washing the pulp with hot water and with dilute waste sulphite liquor to act as an acid emulsifying agent proved effective. Alkaline washing did not prove advantageous.

Fractionation of the pulp resulted in the concentration of pitch in the fraction of fines, along with dirt and suspended matter.

Certain coniferous woods used in the manufacture of sulphite pulp contain a mixture of resins generally referred to as pitch. The amount of pitch depends on the species and likewise on the freshness of the cut. Schwalbe (81) cites a total pitch content of 4.9 per cent for freshly cut pine, 1.6 per cent for freshly cut spruce; for well-seasoned woods the values are 2.54 per cent and 1.0 per cent, respectively. Cooking of these woods with acid sulphite cooking liquor results in a product in which the pitch either remains enclosed in the still unbroken ray cells (in which it originally existed in large part) or is found in the form of a fine, unstable emulsion in the stock. Under the widely varied conditions of mill operation, the pitch emulsion may break, depositing the pitch in sticky masses at various points in the process. This deposition results in the so-called pitch trouble in the mill and presents to the technical man an extremely complex problem of practical importance.

The purpose of the present study has been threefold: a critical survey of the literature relating to pitch trouble and the remedies, the development in the laboratory of a

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pitchy pulp which will behave in the laboratory in a manner similar to the behavior of pitchy pulp in the mill, and, finally, a critical study in the laboratory of such tests for pitchy pulps and remedies for the alleviation of pitch troubles as have been outlined in the literature, using as pitchy pulp the material prepared in the laboratory in connection with the second phase of this study.

Literature Survey

A. General Discussion.

The extensive literature on pitch abounds with conflicting theories on the causes of and possible methods for eliminating pitch troubles, but none of these theories adequately explains why such troubles occur or how to prevent them. Very good surveys of the literature have been given by Potter *(74)* and Phillips *(73)*.

Sieber's classical work *(7)* on the coniferous resins and pitch in sulphite is a most comprehensive account of the subject up to the date of publication of the revised edition in 1925. He states that the resins which lead to pitch troubles are mixtures of resin and fatty acids together with their glycerides and an inert unsaponifiable material known as resene. Volatile essential oils, such as cymene, pinene, dipentene, and sylvestrene *(30)* are also present. Hibbert and Phillips *(56)* describe these constituents. The fatty acids present include the unsaturated oleic, linolic, and linolenic acids, and the saturated stearic and palmetic acids *(7, 56)*. The natural resin acids are unstable toward the action of heat light, and oxidation, and polymerize to abietic acid or pitchy intermediate products. The unsaturated fatty acids are of the drying oil type and undergo oxidation and polymerization to give a hard, horny mass *(3, 56)*.

Brauns *(38)* has made an extensive investigation, both in the laboratory and in the mill, on the causes and elimination of pitch troubles to find no appreciable relief from seasoning wood or from altering cooking conditions. He developed a process, consisting of properly adjusted additions of waste sulphite liquor and alum to the slush stock, which is being successfully applied in one of the Canadian mills. Theories are advanced to explain the causes of pitch troubles and the mechanism of the process devised to eliminate them. A very good discussion is given of the colloidal nature of pulp and pitch in suspension, the flocculation of pitch, and the peptizing action of waste sulphite liquor. Pitch occurs in two distinct physical forms: namely, lumps or globules visible to the naked eye and small colloidal particles which exhibit the Brownian movement, cataphoresis, and sensitivity to electrolytes. These phenomena and the nature of resinous and fatty acids, together with their insoluble calcium salts, would indicate that the solution is a suspensoid, although it exhibits some emulsoid characteristics as is also pointed out by Sieber *(7)*. The pitch particles in suspension normally carry a negative charge, but this is not sufficient to make the suspension stable. Brauns pictures the aluminum of alum as forming a soap with the resin acids on the surface of the particle, while the sulphite liquor exerts a peptizing effect and brings about an orientation of the absorbed molecules to give a strong negative charge and a stable suspension.

Of the remedies which have been proposed in the literature, Brauns' proposal seems to be the closest approach to a real solution of pitch troubles. The investigation included fundamental work on the problem under actual mill operating conditions, which, in his opinion, are the only conditions under which it can be effectively studied.

Brauns classifies pitch troubles in three forms:

(1) Yellow, pasty substances collecting on the paper machine from the screen plates, through the head box, slice, wire, breast roll, and table rolls, to the couch and top press rolls, and tending to fill up the press felts. He attributes these to pitch coagulation on the paper machine.

(2) Pitch lumps: (a) Large or small, yellowish and very sticky, closely associated with the substance classified under (1) above; and (b) darker, harder, and somewhat less sticky lumps, usually of larger size than (a) and mixed with varying proportions of slime and dirt, picked up in the system. These lumps may be found adhering to any part of the paper machine, or even in the sheet to form "slime holes" on the calender. These lumps are the result of pitch coagulation in the sulphite stock before it reaches the machine.

(3) Black, rubbery substances which gather under the roll guard board and top roll doctors. This is probably the least troublesome form and is caused by pitch which has coagulated in the stock and accumulated on the walls of spouts, pipes, heaters, etc., only to break loose later and find its way to the paper machine.

Strachan *(90)* states that pitch varies from brown to black in color and from a very viscous liquid to plastic solid in consistency. It contains very little saponifiable matter but a large amount of foreign matter, such as lignin and dirt. Its alcohol, ether, and petroleum ether soluble portions vary widely, the alcohol extract being the hardest, darkest, and least sticky, while the petroleum ether extract lies at the other extreme. Attempts to separate the troublesome part with petroleum ether have been only indifferently successful, but it is usually reasonable to expect trouble from pulp having a soft, sticky petroleum ether extract.

Ether and petroleum ether are common solvents for resins, but acetone and 95 per cent alcohol give higher results. Wenzl *(97)* has proposed the use of tetralin as a solvent, while Benson and Bennett *(35)* advocate 70 per cent ethyl alcohol but make no claims concerning how injurious the material extracted is. Richter *(76)* considers that the water soluble portion is also important.

Marini *(68)* states that pitch does not give the red-violet to brown color reaction which is characteristic of rosin with acetic anhydride and concentrated sulphuric acid, but instead it gives a brown-black color turning to green. Klemm (*60*) and Hall (*50*) suggest Sudan III for staining the resinous bodies in pulp for microscopic study. This stain is an alcoholic solution of a basic dye which the pitch absorbs selectively to become brown while the fibers remain colorless.

It is beyond the scope of this paper to discuss fully the chemistry of resins and pitch, but this information may be obtained from the following references in the bibliography: *7, 9, 52, 54, 62, 73, 79, 80, 81, 84, 87, 92, 93, and 100.*

B. Opinions as to the Cause of the Trouble.

Phillips *(73)* gives the following review of the causes of the trouble:

"Schwalbe *(81)* found that there was a higher percentage of fats in screen-resin and also that the petroleum ether-soluble portion was practically the same in both resins, which he considered to be a good indication that this portion was responsible for pitch trouble. His tests showed that resin acids gave no spots on paper; fatty acids gave only slight blemishes, while a mixture of the two gave typical resin spots.

"The fats in wood are considered by Wahlberg *(95)* to be chiefly responsible for pitch trouble.

"R. Sieber *(89)* showed that bisulphite cooking liquor could remove only 4.2 per cent of the total wood resins, while 51.8 per cent was removed in the washing, screening, etc., and 15 per cent in the bleaching. The finished stock thus held 29 per cent of the original wood resins. The resin deposits in the paper were found to resemble greatly the petroleum ether-soluble portion of the wood resins.

"According to B. Johnsen *(58)* pitch trouble is due to the oils and fats in the resins which are soluble in petroleum ether. These give, with calcium and magnesium salts, compounds of a sticky, soapy nature. Rosin does not behave in the same way. In the preparation of the stock, a very fine emulsion forms, consisting of small particles of fat and rosin. This emulsion is unstable, and tends to coagulate in the presence of salts found in hard water. This coagulation of particles causes a further precipitation of similar substances and the agglomeration of particles in masses leads to the deposition of pitchy material. Johnsen states that the resins become comparatively harmless with proper seasoning, and that if wood is stored with allowance for thorough circulation of air, and if the stock is well washed with soft water, pitch trouble should not occur.

"J. Enkell *(46)* has contributed a discussion of the formation of pitch deposits, based on the behavior of colloids. Resin suspension in water is a typical colloid. When this coagulates out, pitch trouble occurs. When a material such as alum size is added, the aluminum sulphate is partly hydrolyzed to hydroxide and free acid. The fibers and the resin particles each bear a negative charge, and so repel each other. The aluminum hydroxide particles become attached to the fiber particles, thereby giving the latter a slight positive charge, sufficient to attract the negative resin particles, and hence prevent coagulation of the latter. Enkell points to three possibilities for the conversion of the resin suspension to a non-injurious form:

(1) Addition of a peptizing emulsoid to stabilize the suspension.
(2) Adsorption of the resin particles on a suitable suspensoid.
(3) Fixation of the resin suspension on the fibers.

"As regards peptization, such materials as gelatin, starch, etc., would be suitable, but are too expensive to be used for this purpose. Waste sulphite liquor has been suggested as having a stabilizing effect, but its effectiveness has not been proved yet.

"Adsorption of the resin particles on China clay, bentonite, talc, etc., has been found to keep the particles from agglomerating. Their use is limited to certain classes of papers, as well as by restrictions as to the amount of ash in the paper.

"The resin can be fixed on the fibers by the addition of aluminum sulphate in the proper proportions. The addition of alkali has the effect of lowering the acid concentration, hence allowing the formation of more aluminum hydroxide, which is desirable. If insufficient hydroxide is formed to fix the suspension, pitch trouble may occur. The presence of hydroxyl ion should have a beneficial effect also in peptizing the fat and rosin solution, so that the latter can be removed in the white water.

"J. Campbell *(40)* states that pitch trouble is largely due to too high rate of hydrolysis of the alum added. The trouble is prevalent in summer particularly, when the water used in the mill is warmer than usual. Campbell found that when the rate of alum decomposition was great, the flocks of aluminum hydroxide were large, and were formed rapidly throughout the mixture, removing pitch particles from the colloidal solution. These flocks, carrying the pitch, drain off on the wire, on top of the pulp, and are compressed on the rolls, forming a pitchy mass.

"In cold weather, or with high acidity, the rate of coagulation was found to be slow. Under these conditions, a fine, powdery flock was obtained, which mixed well with the pulp, and did not filter out on top.

"When the acid concentration was raised until the pH reached 4.3, pitch trouble disappeared, even during the summer months. When the stock-water was heated, pitch was deposited on the wire, but the condition disappeared when the water was cooled again. Campbell points out that the trouble can be largely avoided by having the mixed stock at the proper temperature before addition of the alum, or by adding the necessary amount of sulphuric acid or sodium acid sulphate.

"The investigation of Mowat *(69)* on a series of pulps, showed the resin content of the fiber to be from 1.00-2.15 per cent. Some easy-bleaching pulps had more resin than the strong sulphite. The higher values of resin content were found in the case of pulps that were poorly washed or screened.

"When pulps of high resin content are dried, the resin is liquified, and adheres firmly to the fibers, thus rendering beating difficult."

Schwalbe *(81)* states that 90 per cent of the resinous matter from freshly cut wood is soluble in petroleum ether as compared with 60 per cent in seasoned wood. It would thus appear that not the total resin content but the petroleum ether soluble part is the cause of the trouble. While the resin content alone does not appear to be responsible, difficulties are almost sure to be encountered with pulp from wood having a high resin content. Mowat *(69)* states that a resin content of 2 per cent in pulp is likely to give trouble, which Richter *(76)* considers 1 per cent total extractable material is the minimum that can cause damage.

Pitch deposits are found to contain a large variety of foreign materials such as lignin, dirt, and particles of metals, calcium sulphate, calcium carbonate, etc., but there is considerable doubt as to whether these materials cause the agglomeration or are simply a result. Cooper *(41)* believes that they cause it, and this view is supported by the fact that stopping of leaks in the sulphur dioxide lines to prevent the formation of colloidal calcium sulphate in the cooking liquor has been known to bring relief. It is only the undissolved particles which give trouble, since the saturated solution of calcium sulphate or calcium carbonate is harmless *(91)*. Such particles are removed by proper settling of the cooking liquor in storage, but colloidal sulphur in the cooking acid may produce more in the digester by causing liming. Since calcium sulphite is found in pitch spots in paper made from bleached pulp *(41, 61)*, the particles must be completely embedded in resin in the cooking process to be so protected from oxidation. The fact that various clays such as bentonite relieve the trouble by coating the pitch particles and masking their stickiness would indicate that these other suspensoids would do the same. One writer even claims that trouble only occurs when the SO_3 content is low. In any event, such materials would lead to dirty paper and should be avoided as much as possible.

Through carelessness, sulphite turpentine from the recovery may find its way into the digester with the cooking liquor and cause trouble by extracting the resins from the chips and collecting them at the surface *(16, 63, 91)*.

Sieber has advanced the theory that a pulp which loses much of its pitch during beating will give trouble. Thus, trouble with soft and generally weak pulp is brought about by cooking conditions, since overcooking weakens the ray cells *(45)* containing the pitch with the result that in beating they are ruptured and liberate their pitch. Undercooked pulps generally give little trouble. The relatively small ray cells are protected in ordinary beating by the larger fibers unless the beating is prolonged. Thus, resin *on* fibers is loosened by agitation and abrasion in the ordinary beating, while that *in* the ray cells is undisturbed; in the case of the latter, however, the strong shearing action of a kollergang readily ruptures these cells to liberate their pitch also *(39)*.

It is thought *(91)* that the trouble is in the pulp rather than in machine conditions, since changing pulps will often improve pitch difficulties. Instances are on record, however, where one of two machines running on stock from the same chest has given serious trouble while the other gave none.

Pitch particles loosened by agitation are, to a large extent, carried through the wire of the paper machine along with the short fibers. In a closed white water system, the concentration of particles increases to make trouble more likely.

Moist pulp seems to be worse than dry, probably on account of the continuation in the dry pulp of the same changes which occur in seasoning the wood, since storage of pulp helps. In spite of the fact that pulp made in the hot summer months has a relatively low resin content, it gives more trouble. This is sometimes attributed to lower free sulphur dioxide in the cooking acid during hot weather. Elevated temperatures in beating and on the paper machine cause greater dispersion of pitch and also make the material softer and more sticky, thus increasing the danger of coagulation *(21, 40)*.

The calcium and magnesium of hard waters react with the pitch acids to give sticky, insoluble soaps which agglomerate with more pitch particles to form lumps, and warm water increases this formation.

A considerable quantity of air in the form of tiny bubbles is admixed with paper stock by the action of the beater and centrifugal stock pumps and by the cascading of the stock in conduits or from spouts into chests and the head box. High consistencies in the beater increase this action. It has been suggested *(19)* that these bubbles collect pitch particles on their interfaces and carry them to the surface of the stock where the bubbles break and leave the pitch to agglomerate into lumps. Later, these form specks in the paper or collect on the surfaces of the system. Brune *(39)* emphasizes this effect and recommends designing the piping of the system so as to prevent splashing and admixture with air insofar as possible. He would introduce stock into the chests and head box from the bottom so that, as it rises, it will be moving in the same direction as any air bubbles which may separate out. This would reduce the shearing action of the air on the fibers and thus decrease the amount of resin collected.

Strachan *(90)* endorses this theory and recommends a pH between 6.8 and 8.4 to hold this effect at a minimum. Pitch particles, fibers, and air bubbles in suspension are normally charged negatively so that they are mutually repelled, but the air may become positively charged in solutions of a lower pH so as to attract and collect the pitch particles.

There is some difference of opinion as to the effect of beating on dispersed pitch. Some believe that it disperses further, while others compare its action with the churning of milk to separate butter. Alum, other precipitating agents, and fillers tend to cause the pitch to accumulate in specks. This action, of course, is greater on pitch which has been loosened from the fibers.

Improper handling of the pulp in the blow pit may often be responsible for pitch trouble later on in the operation, since cold water will not wash out the pitch but will set it on the fibers. In the subsequent operations of beating and jordaning, the material is scraped off and dispersed to form a potential menace which only awaits proper conditions for coagulation to become injurious.

C. Prevention Methods Suggested.

The following is a further quotation from Phillips *(73)*:

"Seasoning in air is so far the most effective means of preventing pitch trouble, but is not always sufficient. . . . When wood is seasoned for a long period *(65, 73)* of time, changes take place in the resins, due to the action of air and light. The resin content drops considerably at first, but finally reaches a nearly constant value. The resins of seasoned wood are much less viscous and sticky than those of the green wood, and their solubility in ethyl ether, petroleum ether, benzene, etc., becomes less. The seasoned wood is much less likely to give rise to pitch trouble than is the green wood. The seasoning in air seems to cause oxidation or other changes in the resins, rendering them much less troublesome. It is significant that the same result can be achieved by storing wood, in the form of fine chips, for about three weeks, as by allowing it to stand, in log form, for one or two years *(7, 65, 81)*.

"Various methods of treatment of wood and pulp have been proposed, some of which are of real value. Heating the digester to 160 deg. C. *(31, 99)* before blowing is said to cause the resin to form a fine suspension which is largely removed in the waste liquor. Also, careful washing of the stock with soft water, has been employed with success.

"Pretreatment of the wood with organic solvents to remove the resins before cooking has been suggested often, but is not practicable yet on account of cost. Other processes have been patented in recent years, which may offer a real solution of the pitch problem. One of these *(49)* involves the treatment of the chips with hot water under high pressure, followed by treatment with an acidic solution to remove the resinous substances, and finally washing under pressure. Another process is based on the addition of sodium ion *(16)* to the bisulphite cooking liquor. [Rinman *(20)* suggests treating the chips with a small amount of organic resin solvent to dissolve out the resin during the cook and allow it to collect on top and be tapped off through a side opening just before blowing the digester.] These processes are not in general use at the moment.

"Emulsifying agents have been found to be successful in certain cases; for example, Twitchell's reagent has been found to be of some use, as well as certain oils *(97)*. Certain processes involve the use of mineral acids *(40, 46)*.

"The portion of the wood resins soluble in petroleum ether, has been mentioned frequently as being the cause of pitch trouble. This portion is a complex mixture, and its exact composition has never been determined. In certain cases, approximately equal amounts of resin acids, fats, and so-called indifferent substances have been found *(93)*. One or more acids of the oleic series are known to be present in the fatty portion. The indifferent substances have been so named on account of their neutral character, but have not been characterized further.

"The resins of fresh wood are appreciably soluble in petroleum ether, but become less soluble when the wood is seasoned, or treated with cooking liquor at high temperature. Changes take place in the resins under these condi-

tions, which seem to have a fundamental bearing on the matter of pitch trouble.

"Solubility of these resins in petroleum ether is purely a relative matter. All the constituents making up the resinous portion of the wood are appreciably soluble in ordinary organic solvents, and solubility in any one of the latter gives no clear-cut distinction between substances or groups of substances.

"From the information hitherto available, it is not possible to say with any certainty, which part of the total resin gives rise to the pitch trouble. One component may be responsible, or a group of substances may be the cause. Beyond separating specimens of resins and pitch into certain fractions, no attempts have been made up to the present, to establish definitely the nature of the individual constituents of these mixtures, or to investigate the chemical changes which they undergo in the process of the seasoning of the wood, or under the influence of light, heat, oxygen, etc."

Sieber *(88)* states that increased age of stored pulp is accompanied by an actual decrease in resin content and a more firm setting of it on the fibers. The amount present actually decreases with aging, and pulp prepared from aged wood contains less pitch. Therefore, the amount dispersed by beating action depends upon the age of the pulp, its pitch content, and the degree of beating.

The following material has been obtained from a special report of the Technical Association of the Pulp and Paper Industry *(91)*: It has been suggested that bentonite be added to the stock before the rifflers and strips of felt be allowed to drag on the surface to collect the pitch particles surrounded by the bentonite. The rifflers may also be lined with long fibered felt to assist in collecting the pitch. These felts must be replaced frequently. The same treatment will remove pitch to a somewhat less extent without bentonite. A felt-covered roll in the beater has been found to collect quantities of pitch in a similar manner.

One-half to two pounds of sodium thiosulphate in the stock per ton of paper is said to be giving good results by acting as a hardener for the pitch, and similar results are reported for Smith's solution which consists of sodium sulphite and sulphuric acid. Excess alum is effective in precipitating the pitch as a size, but it is corrosive to the equipment. Increasing the combined sulphur dioxide from 1 to 1.2 or 1.3 per cent is said to have decreased the trouble in some cases. The addition of 30 to 50 pounds of soda ash per ton of pulp in the digester is widely practical on account of its low cost, although it is of doubtful value. Washing *(24)* with water at 40 deg C. or above with pressure spray nozzles is said to be effective in washing out pitch and preventing its sticking to the fibers and thus interfering with the beating operation.

Mowat *(69)* draws attention to the greater resin content of heartwood as compared with sapwood, and suggests grading logs according to age.

Cyster *(43)*, finding that pulp whose resin has been extracted with ether had a lower bleach consumption than unextracted pulp, would propose the addition of a small amount of bleach as early as possible in the processing to oxidize and harden the pitch. The calcium soaps of the oxidized residues are no longer sufficiently sticky to give trouble. Wimmer *(31, 46, 99)* would heat the pulp to 160 deg. C. before blowing to loosen the fibers and disperse the pitch so that it may be washed out or be removed in the white water. Barnes *(31)* claims that the resins have a critical point at 150 deg. C., above which they harden and lose their stickiness.

Richter *(76)* and Johnsen *(58)* find little or no advantage in using kerosene to stabilize the pitch suspension in stock.

Oils used to kill foam or lubricating oils from leaks *(43)* may often agglomerate with pitch to produce pitch trouble.

Phillips *(73)* suggests that triethanolamine may offer possibilities for removing or rendering harmless the resinous matter in pulp, since it combines with the oleic and linolic acids present to give soaps of high solubility and emulsifying power *(98)*. This would reduce the agglomerating tendency of the particles to a minimum, but the lowering of surface tension involved would, on the other hand, increase the danger of foaming. Special emulsifying agents used in textiles have often proved helpful. Alum, sodium hydroxide, carbonate, silicate, and phosphate have been tried in the beater with some success. DeCew *(44)* proposes the use of wax emulsions as stabilizers.

With regard to paper machine operation *(91)*, a motor-driven stirrer in the head box breaks up and disperses the pitch lumps just before going on to the wire. Suction boxes should not be above the wire line since this would cause a pressure on the edges of the box sufficiently high to force the pitch into the wire mesh. Higher suction increases the danger of pitch troubles. End-of-grain wooden suction boxes are said to give the best results. Sulphuric acid, soda ash, and caustic soda are used for cleaning pitch off the wire. Hot caustic periodically sprayed on the returning wire keeps it clean without interrupting production. Special emulsifying agents offer possibilities for both wires and felts. Steam and petroleum hydrocarbons are also used on the wires.

Bleaching loosens some of the pitch from the fibers so that it can be washed out, as well as hardening the remainder so as to reduce the danger of agglomeration.

Schwalbe *(81)* considers that an acid wash reacts favorably for the removal of pitch and that acid emulsifying agents are to be preferred. Twitchell's reagent, made by sulphonating oleic acid and naphthalene, is such an agent and emulsifies 41 per cent of the resin. Waste sulphite liquor has a similar effect.

Kaustinen has patented a process of adding 1 to 2 per cent of lime to the pulp in approximately 2 per cent suspension before pumping it to the paper mill. This favors an increased formation of aluminum hydroxide to precipitate the pitch on the fiber.

Most of the pitch occurs inside the ray cells *(45, 91)*, where it causes no harm. To keep these cells intact, it is suggested that the following measures be observed: a low blowing pressure, moderately hard cooking, moderately high combined sulphur dioxide, uniform penetration of chips and good circulation, and avoidance of the presence of sludge in the cooking acid.

The use of extra water in a well-closed system reduces pitch trouble. Low temperatures and stock which is as free as possible on the wire will give the best results. Elevated temperatures may damage the stock and do not always bring relief.

Erkensators remove some pitch and fine fibers from the paper stock, but they also assist in causing coagulation, so that they are often by-passed in order to run the pitchy pulp by the shortest possible route through the mill. Admixing resinous pulps with non-resinous pulps helps in proportion to the amounts and specific properties. Alkaline cooked pulps are especially effective. Groundwood pulp is also effective, especially since with it the sulphite is usually only slightly beaten. Two or three different sulphite pulps together are preferable to one alone. Alternating sulphite and kraft in the beater, where possible, helps to keep down pitch deposits. Minimum beating and maximum jordaning are also recommended. Breaking and beating separately are advisable.

Edge *(45)* has found that screening out the fines amounting to only 2 per cent of the fiber removes 20 to 50 per cent of the pitch, as well as most of the dirt and ash content. The pitch removed consists of both that dispersed and that contained in the tiny ray cells. In extreme cases where even this treatment does not end the trouble, seasoning of the wood and oxidation treatment is recommended. Edge states that larger and faster machines which must use higher suction give more trouble, so that the pitch problem must be solved to allow further expansion. He introduces a unique idea of beating the pulp or its fines in a ball mill and using the amount of pitch deposited on the balls and walls as an indication of the trouble to be expected.

By adjusting the cooking curve to suit the wood used, Herty *(53)* claims to overcome pitch troubles. Dense, slow growing woods of the north require different treatment from the lighter, fast growing southern pines.

Kowalewsky *(64)* has found that flotation with lime and kerosene at 20 to 35 deg C. reduces the pitch content from 1.0 to 0.3 per cent.

Strachan *(90)* denies the ill effects of violent agitation, but blames the shearing action which ruptures the ray cells to liberate and disperse their pitch. He advises avoiding alkaline conditions, excess alum, elevated temperatures, pitch solvents or softeners (soda ash, paraffin, or turpentine), and high consistencies in the beater. An oxidized metal surface has a positive charge and attracts pitch. Alkali or paraffin reduces this attraction, but softens the pitch to give worse effects. By speeding up the wire, the sheet may be made to carry the pitch on to the rolls where it is collected by the doctors, thus reducing the damage. Strachan looks to improved digester operation for a final solution.

Karlberg *(59)* claims to eliminate completely the coagulation of the pitch particles by keeping the pH of the stock between 4.4 and 5.0 through the use of alum.

Hazmburg *(51)* has patented a process for placing electrically charged plates or grids in the system to remove the pitch.

Low *(67)* has patented a process for hardening soft, natural resins for use in varnishes by treating them with water vapor and formaldehyde under pressure at somewhat elevated temperatures. No account has been found of any attempt to use this to render pitch harmless, but it was investigated to some extent in connection with this study.

Potter *(74)* considers the following measures as most effective in eliminating or reducing pitch trouble:

(1) Proper seasoning of the wood, preferably in the form of chips, where 2 to 3 weeks are equivalent to seasoning logs for 2 years.

(2) Washing with soft water to avoid tacky calcium and magnesium resin soaps, and at 40 deg. C. to prevent the pitch from sticking to the fibers.

(3) Arranging the conduits to avoid admixing of air.

(4) Cooling the stock and adjusting its pH before adding alum so as to slow up the precipitation of aluminum hydroxide.

(5) Using emulsifying agents to keep the pitch dispersed.

Discussion

A. Preparation of Pitchy Pulp for Laboratory Study

A sample of pitch collected on the press of a paper machine by the doctor was found to be a dark brown, tacky mass of which about 50 per cent was fiber and foreign material. Calcium, determined as oxide, was found to the extent of 2.3 per cent. The petroleum ether extract, amounting to 48.6 per cent, was discovered to resemble natural spruce resin very closely in appearance, consistency, and chemical properties. This suggested the possibility of preparing pitchy pulp by the addition of an alcoholic solution of the natural resin to a water suspension of the pulp to precipitate it as a very fine suspension. This was tried and found to give satisfactory results. Three standard pitch solutions were therefore prepared, using pitch obtained by scraping the material present on the butt ends of freshly cut spruce pulp wood: Solution I contained 22.6 grams of oven-dried petroleum ether extract of the spruce pitch in 250 cc. of alcohol; Solution II contained spruce pitch extracted with alcohol in a Soxhlet extractor (0.1 gram per cubic centimeter); and Solution III contained the pitch extracted with cold alcohol.

B. Investigation of Tests and Remedies

1. The Elimination of Tackiness of Pitch as a Means of Controlling Pitch Trouble.

Physical Properties of Pitch and Rosin.

Although rosin is closely related to pitch, it does not exhibit any of the injurious properties on the paper machine that are characteristic of pitch. Therefore, the physical and chemical properties of pitch were compared with those of FF grade rosin. Eighty-nine (89.0) per cent of the fresh pitch was soluble in petroleum ether as compared to 81.4 per cent for rosin, and the oven-dried extracts showed for pitch a dark, viscous oil whose color indicated decomposition on heating, and for rosin a hard, brittle, and much lighter colored mass. In both cases the insoluble residue was found to be hard and brittle after oven-drying.

Only 28.7 per cent of the original petroleum ether extract of spruce pitch was found to be still soluble in that solvent after being held at 105 deg. C. for 18 hours. The insoluble residue was left in the form of a white curd. The same was true to a lesser extent for rosin. The change must have been due, at least in part, to oxidation; and, since the residue was soluble in alcohol, it may explain why there is no decrease in alcohol solubility of pitch upon aging.

Rosin was found to be completely soluble in alcohol, while spruce pitch is not, the alcohol-benzene extract being slightly higher. However, the part insoluble in alcohol is of such a nature as to be harmless in paper making.

Rosin was found to become tacky only at about 45 deg. C., so suspensions of it in stock were found to give no tackiness or deposit upon agitation in the laboratory stirrer at room temperature. Heating the suspensions up to 45 deg. C. or above immediately produced phenomena similar to those of pitch at normal temperatures, because pitch remains soft and tacky even at 0 deg. C. This shows quite clearly that pitch trouble is closely related to the stickiness of the resinous material present. The absence of tackiness in any extract, therefore, provided no change has occurred during the extraction, indicates that that particular material is harmless.

Chemical Properties of Pitch and Rosin and the Effect of Various Treatments

The chemistry of pitch shows that it is made up, in part, of long-chain hydrocarbon acids (oleic, linolic, and linolenic) having one, two, and three unsaturated linkages, respectively. Besides possessing acid properties, such acids are easily oxidized at their double bonds with the addition of hydroxyl groups; they can polymerize under oxidizing conditions with heat and light to satisfy unsaturation; or they can undergo reduction to stearic acid. Each of these reactions renders these drying oils hard and destroys their tackiness. In the sulphite digester, however,

the reducing conditions present prevent oxidation but are not sufficiently drastic to produce stearic acid by reduction, with the result that little or no hardening of the resins occurs.

Along with the fatty acids in pitch there are some unstable cyclic resin acids of unknown structure which can polymerize under the action of heat and light to give some very tacky intermediate products *(56)*.

Acid and saponification numbers of the resins indicate that small portions of the acids are combined as glycerides. A small amount of inert, waxy material called resene is also present.

Acid, saponification, and iodine numbers were run on rosin and pitch and their various fractions in an attempt to discover wherein they differ. The results of these tests are given in Table I.

TABLE I
THE RELATION OF THE CHEMICAL CONSTANTS OF ROSIN AND PITCH AND THEIR EXTRACTS

Sample	Iodine number	Acid number	Ester number
Whole rosin	160	15.9	1.2
Whole spruce pitch	154	12.1	0.3
Petroleum ether soluble			
(a) Rosin	172	...	...
(b) Pitch	130	12.3	2.2
Insoluble in petroleum ether			
(a) Rosin	164	...	...
(b) Pitch	93	10.2	11.5

Prolonged heating was found to cause hardening, darkening, and a decrease in weight and iodine number for all samples of pitch and rosin and their extracts. That these effects are chiefly due to oxidation is shown by the much greater effect observed when the samples were heated in open 125-cc. flasks than when heated in flasks closed by loosely stoppering the flask after displacing the air by nitrogen. The results are given in Table II and Table III. (See Table II, No. 2 and 3, and Table III, No. 3 and 4.)

TABLE II
THE EFFECT OF HEATING ON THE CHEMICAL CONSTANTS OF ROSIN AND ROSIN EXTRACTS

Treatment	Iodine number	Acid number	Ester number
Whole rosin			
(1) Untreated	160.0	15.9	1.2
(2) Heated 18 hours (closed)	127.1	15.7	1.8
(3) Heated 18 hours (open)	88.0	15.5	1.3
Petroleum ether soluble			
(4) Dried 1 hour	172.0	...	...
(5) Heated 18 hours (open)	52.3	...	...
(6) Treated with H_2O_2 in alcohol solution	84.2	...	...
Petroleum ether insoluble			
(7) Dried 1 hour	164.0	...	...
(8) Heated 18 hours (open)	133.0	...	...

In Table III, the first four experiments refer to samples of whole spruce pitch heated in the oven at 105 deg. C. in flasks. In experiments No. 5, 6, and 10, reference is made to extracts of normal spruce pitch. For the other experiments, portions of standard pitch Solution III were absorbed on filter paper, dried, and treated as shown, after which they were extracted first with petroleum ether and then with alcohol. The portion dissolved by the alcohol is designated in the table as "petroleum ether insoluble." When not otherwise indicated, the heating was for one hour.

Table IV shows the effect of heating and oxidation with permanganate on the original spruce pitch.

Table V shows the minor change in the acid, saponification, and iodine numbers of the pitch of the raw spruce wood as compared with the pitch in sulphite pulp produced from this wood.

It is interesting to note that heating reduced the iodine number and thus the degree of unsaturation, to a minimum value of around 50 to 70 for all the materials tested. Heating in an atmosphere of nitrogen did not prevent this action but did markedly decrease it, as shown in the tables.

TABLE III
THE EFFECT OF REAGENTS AND HEATING ON THE CHEMICAL CONSTANTS OF SPRUCE PITCH

Treatment	Iodine number	Acid number	Ester number
Whole spruce pitch			
(1) Solution III, raw spruce pitch *	154.0	12.1	0.3
(2) Dried 30 minutes			
(a) Solution I	141.3	...	...
(b) Solution II	168.0	...	...
(c) Solution III **	132.0	12.8	1.8
(3) Heated 18 hours (open)			
(a) Solution I	107.3	...	...
(b) Solution II	51.8	...	...
(c) Solution III **	44.8	12.4	8.9
(4) Heated 18 hours (closed) Solution III	95.5	11.6	4.8
Petroleum ether soluble			
(5) Dried 1 hour	130.0	12.3	2.2
(6) Heated 18 hours (open)	52.3	...	...
(7) Treated with H_2O_2 on filter paper			
(a) Dried 1 hour	68.0	...	...
(b) Heated 18 hours	61.1	...	...
(8) Treated with $KMnO_4$ on filter paper	49.0	12.4	2.0
(9) Treated with HCHO on filter paper	67.6	...	...
Petroleum ether insoluble			
(10) Dried 1 hour	93.0	10.2	11.5
(11) Treated with HCHO on filter paper	109.0	12.4	1.7

* This determination was run on the alcoholic solution of raw pitch without drying.
** These solutions are the pitch stock solutions described in Section A of the introductory discussion.

TABLE IV
THE EFFECT OF HEATING AND TREATMENT WITH ACID PERMANGANATE ON SPRUCE PITCH ABSORBED IN FILTER PAPER

Treatment (Pitch Solution III)	Iodine number	Acid number	Ester number
(1) Filter paper hung 6 hours in oven (open)	80.6	12.9	3.4
(2) Enclosed 6 hours in tube (loosely closed)	94.8	12.3	3.6
(3) Treated with $KMnO_4$ on filter paper	51.8	13.1	2.1

TABLE V
COMPARISON OF THE ALCOHOL EXTRACTS OF RAW WOOD AND SULPHITE PULP

Material extracted	Refractive index	Iodine number	Acid number	Ester number
Spruce wood	1.5078	147.5	5.8	7.1
Spruce pulp	1.5130	118.0	5.7	5.7

This would indicate that oxidation is only a contributing factor and that some other reaction occurs. It is reasonable to believe from the properties of such unsaturated compounds that polymerization has taken place. The petroleum ether extract is accepted as containing most of the fatty constituents, but its iodine number appears to be only a little higher than that of the resinous portion which is insoluble. Thus, the resins have but a slightly lower degree of unsaturation than the fats. It is undoubtedly this unsaturation which permits the natural resin acids to polymerize to abietic acid. This is in agreement with the literature *(7)*.

With regard to the acid and ester numbers, rosin, having a lower molecular weight than the fatty acids, would naturally have a higher acid number than spruce pitch; and, as would be expected, the saponification number (acid plus ester number) of the portion of pitch insoluble in petroleum ether is much greater on account of its higher content of resin acids. This portion also includes most of the esters. Heat and oxidation have no appreciable effect on these numbers.

Aging of Spruce Pitch in Air.

When pure pitch or its extracts were left exposed to air, they grew gradually harder, first forming a tough skin around the soft material and finally becoming so hard and brittle that they would no longer be harmful in pulp.

Since the petroleum ether soluble portion of pitch contains the tacky material and is the portion decreased in aging, this decrease was taken as a measure of the aging of pitch.

In preparing samples for the aging tests, a very good example was found of the unreliability of extractions of

pulp samples as an indication of probable trouble on the paper machine. An attempt was made to prepare sheets of uniform pitch content from suspensions of exactly the same amounts of pitch, water, and pulp stirred and handled in exactly the same way and filtered off on filter paper in a Büchner funnel. The resin contents of these sheets were found to vary so widely that the sheets could not be used to show up the small changes produced by aging. Such results under controlled conditions would explain why sampling and making extractions on mill stock would lead to false conclusions, as the dispersed pitch would not be uniformly distributed in the sample.

Six filter paper samples were therefore impregnated with equal amounts of pitch solution. These were allowed to dry over night and age for periods as shown in Table VI and Fig. 1. As the aging progressed, the petroleum ether extracts became harder until, after the first week, all tackiness was gone and no pitch deposition occurred when a solution prepared by dissolving the petroleum ether extraction in alcohol was added to stock in the stirrer.

TABLE VI

DECREASE IN PETROLEUM ETHER SOLUBILITY ON AGING OF SPRUCE PITCH AT ROOM TEMPERATURE

	Hours aged						
	0	12	48	78	198	336	552
Per cent petroleum ether soluble...	93	91.5	86.4	81.2	74.1	64.8	57.0
Per cent total alcohol soluble.....	100	99.0	98.4	98.1	98.0	98.0	98.0

Similar samples prepared by absorbing an alcoholic solution of spruce pitch on filter paper were used to determine the effect of various treatments on the solubility of the treated pitch, in petroleum ether. Table VII summarizes these data. The permanganate solution was of a strength of 25 cc. each of N/10 $KMnO_4$ and 4N H_2SO_4 in 750 cc. For the bleach test, 750 cc. of solution containing one gram of chlorine per liter was used.

TABLE VII

PETROLEUM ETHER SOLUBILITY OF SPRUCE PITCH AFTER VARIOUS TREATMENTS

Treatment	Petroleum ether soluble	Total alcohol soluble
(1) Fresh untreated spruce pitch	93.0	100
(2) Exposed to sunlight for 6 hours	89.5	100
(3) Enclosed in dark for 2 weeks	80.5	100
(4) Treated with $KMnO_4$ for 10 minutes	94.8	96.8
(5) Treated with $KMnO_4$ for 1 hour	83.7	93.7
(6) Treated with $KMnO_4$ for 1 hour—Solution III	92.6	96.0
(7) Treated with bleach for 30 minutes	84.1	90.0
(8) Aged in oven for 7 hours at 105 deg. C.	46.6	81.6

Sheets of filter paper impregnated with spruce pitch, when held for two weeks in a sealed test tube away from light, showed no more aging than when exposed to air for four days, and most of this probably took place before the sheets were placed in the tube. The aging was somewhat faster even in the mild winter sun, and strong summer sun would be more effective. It is interesting to note that the oxidizing agents caused little or no decrease in solubility, in some cases even giving an increase, but the extracts were bleached out to a light golden brown and were quite hard and brittle. Evidently, the reaction was one of straight oxidation at the unsaturated linkages of the acids without any polymerization which would also reduce the solubility, as shown by the sample that was aged in the oven exposed to air for seven hours.

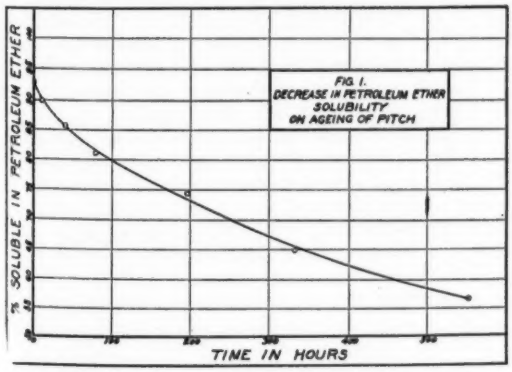

FIG. 1

Sulphite Pulping Data and the Action of Formaldehyde.

Barnes *(31)* describes a method of pulping to harden pitch by raising the digester temperature to 155 to 160 deg. C. for 30 minutes just before blowing the cook. Two laboratory cooks were made on spruce chips in autoclaves according to this procedure. In one cook the temperature was not allowed to exceed 148 deg. C., while the other was heated to 155 deg. C. for the last half hour. The ether extract from the pulp cooked at the higher temperature was somewhat harder and less tacky than that of the normally cooked pulp, but the slight improvement would hardly be worth the reduction in yield and pulp quality caused by the excessively high temperature.

Low's patented process *(67)* of hardening soft, natural resins with formaldehyde was tried out on spruce pitch by making a series of tests under the various conditions of pulp manufacture and use. Its effect was first tried in the beater with 200 grams of unbleached pulp slushed in 12 liters of water and treated with 1 per cent of pitch Solution I in the usual manner and then with 20 cc. of 37 per cent formalin. Deposition on the plates began immediately, but the deposit seemed to be less tacky than when formaldehyde was absent; however, the improvement was not sufficient to be of value. When more time was allowed for the action of the formaldehyde on the pitch, no improvement over the first test could be detected.

The effect of heating formaldehyde and pitch suspensions in the presence of cooking and waste sulphite liquors was also investigated. The boiling caused the pitch to collect on top of the liquor so that it could be easily removed for examination. In each case, the formaldehyde-treated samples were granular and brittle and would be completely harmless in the mill.

As these results seemed promising, further experiments were undertaken to determine the effect of the formaldehyde on pitch in pulp suspensions. In the mill, following the blowing of the digester, stock in the presence of waste liquor at about boiling temperature could be conveniently treated with formaldehyde for an hour; or, after washing out the waste liquor, it could be treated in hot water for an hour. Furthermore, formaldehyde could readily be kept in contact with cold stock for five hours. A test and a blank for each of these conditions were run on samples of freshly cooked, unwashed chips obtained from a Mitscherlich mill. After this treatment, each sample and its blank were filtered, washed, dried over night, extracted with ether in the cold, and the extract evaporated under suction. Oily masses were obtained in all cases, so that unless some change was brought about in the dissolving in ether and subsequent warming and drying, the treatments were wholly ineffective.

The only possibility left was that some favorable reaction would take place at higher temperatures under pressure. To determine these effects, three autoclave cooks were made on freshly cut spruce sawdust. One was a regular sulphite cook as a blank, the total time of the cook being 8 hours and the maximum temperature 148 deg. C. In the second cook, the sawdust was covered with a liter of water and treated with 25 cc. of formalin, the autoclave being heated to 120 deg. C. for a total period of 3 hours. The third cook was a regular sulphite cook except that 25 cc. of formalin were added to the liter of

cooking liquor. Ether extracts of the washed and dried stock from the first two cooks showed no improvement to be derived from treating wood with the formaldehyde solution. In the cook where formaldehyde was added to the regular cook, the pressure was found to rise much more slowly with temperature rise than in the normal cook. Evidently, some condensation occurred between the sulphur dioxide, lignin, and formaldehyde. In any event, the first cook tried adding formaldehyde to the regular cook, as well as a later check run, gave burned pulp with very little of the lignin removed.

2. The Stabilizing of Pitch Suspensions as a Means of Overcoming Pitch Troubles.

Properties of Pitch Emulsions.

Half a gram of pitch in the form of Solution I was added to 500 cc. of distilled water to give a stable emulsion with no tendency to coagulate on standing. The addition of alum to a portion of this emulsion gave no apparent immediate effect, but separation of a very fine precipitate with a *tacky feel* occurred on standing. When, however, a few drops of 1 per cent caustic soda were added, flocculation occurred at once, leaving a clear, supernatant liquid. The formation of small particles of alum floc with slow hydrolysis and flocculation of alum at low alkalinity and rapid separation of large flocs at high alkalinity is in agreement with the observation of Campbell *(40)*. By following the pH of the solution in a similar test, flocculation was found to take place at a pH of 4.3.

Under the microscope with Sudan III staining, the almost colorless flocs of aluminum hydroxide were observed to hold the pitch particles, stained brown, on their surfaces. Pulp in tap water or waste sulphite liquor, when stained with Sudan III and then examined microscopically, was found to show pitch in three forms: in the ray cells, as a suspension of particles showning Brownian movement, and as aggregates floating on the liquid. The pitch suspension alone in distilled water appeared to be a typical suspensoid. The particles in Brownian movement could be clearly seen against a dark field. Pulp in a dilute solution of Gardinol showed a uniform suspension and almost perfectly clean fibers, free from pitch.

The technique of applying the stain to the sample on the slide involved draining off the excess water on a blotter and then adding several drops of the alcoholic dye solution, allowing it to stand for one minute, draining, adding a few drops of distilled water, draining, and again adding distilled water to serve as a medium for observation.

Ball Mill Beating.

Almost all coniferous sulphite pulps contain more or less resinous material, which may or may not be harmful and give trouble in processing. According to Sieber and others, the troublesome pitch will come out in the beating, so that the pitch content of the pulp before beating will be higher than after a portion of the pitch has been dispersed. If this material is sufficiently sticky or tacky to give trouble, it will stick to the beater walls, piping, chests, wires, etc. Working on this theory, Edge *(45)* proposed beating the pulp sample in a miniature ball mill and extracting the pitch that adhered to the balls and walls as a measure of the trouble to be expected from the pulp. To try out this idea, a heavy glass bottle of 400-cc. capacity, containing enough steel shot to cover the bottom, was mounted on a small motor-driven shaker and used as a pebble mill. Shaking for 20 minutes in this device gave a well-beaten pulp in which most of the ray cells were broken up to liberate their pitch. The violent shaking would also help to admix air with the stock and thus aid the agglomeration of the dispersed pitch so that it could adhere to the shot and walls. Three-gram samples of pulp and 50 cc. of distilled water were used for the tests. After the beating, the pulp was carefully washed out of the bottle, leaving the shot behind. After thorough rinsing and draining, the bottle and shot were washed eight times with 95 per cent ethyl alcohol. The combined washes were evaporated and dried at 105 deg. C. The 200-mesh screen fraction from the fractionation of an unbleached Mitscherlich pulp was found to deposit 0.6 per cent of its weight of pitch. The addition of pitch Solution I (0.27 grams of pitch) to 3 grams of the long fraction, which was known to contain only a trace of pitch, was found to give a deposit of 0.112 grams of pitch. Extraction of the beaten pulp after filtering on filter paper and drying gave 0.119 grams to show a loss of 0.04 grams in the filtrate. Sufficient tests were not made to draw conclusions as to the quantitative value of this test, but it seems to offer a good qualitative test for injurious pitch in pulp.

Beater Tests.

Another qualitative test for pitch in pulp was carried out in a one-pound Valley beater. The pitch dispersed by the beating was found to collect on the surface along with foam to indicate that it was carried up by the air bubbles which were admixed with the stock by the beater roll. Three brass plates, wide enough to extend across the path of the stock, were allowed to drag on its surface and collect the pitch in the form of a curdy mass, together with foam and some fiber. Strips of fourdrinier wire were also placed along the walls of the beater below the surface of the stock to see whether or not they would collect any pitch.

A 460-gram sample of the balsam fir unbleached Mitscherlich pulp was broken up in 23 liters of tap water in the beater, and 1 per cent of pitch was added in the form of Solution I. The brass plates and three strips of screen were inserted to collect the pitch. The roll was then started rotating without any weights on the bedplate. Depositing on the brass plates began immediately, and ultimately a large portion of the pitch added was collected by them. After circulating the stock for 30 minutes, the screens were removed, washed carefully until free from fiber, and dried at room temperature. Extraction of the stock with petroleum ether in the Soxhlet gave 0.06 grams of pitch. It is very likely that a pulp which gave a deposit on the wire would also give it on the paper machine. A deposit on the plates, on the other hand, would not necessarily mean trouble, for all pulps were found to give deposits on the plates. If the deposit were tacky, however, as it was in this case, trouble could be expected.

The deposits on the plates were collected, dried, and extracted with alcohol to give 0.52 grams of viscous, sticky pitch. Further extraction of these deposits with acidulated alcohol removed 0.07 grams of additional pitch to show that some of the material was in the form of metallic soaps. A trace of calcium was also found.

To determine whether or not insoluble calcium salts in suspension and hardness of the water are necessary for the agglomeration of pitch, 400 grams of the balsam fir pulp were broken up in distilled water and treated with 30 cc. of concentrated hydrochloric acid, while stirring. After 10 minutes, the suspension was drained through a cloth, pressed, redispersed in distilled water, and redrained and pressed repeatedly to remove all salts. Half of this material (200 grams) was furnished to the beater which had been previously thoroughly rinsed with distilled water. The copper plates, also carefully cleaned, were inserted and 2 grams of pitch (20 cc. of Solution I or 1 per cent)

were added from a pipette with its tip below the surface of the stock just in front of the roll.

A rather dark deposit of what appeared to be pure pitch, except for some pulp mixed with it, began to form immediately. The rate of deposition was even faster than when hardness was present, showing that neither hardness of the water nor the presence of suspended particles of calcium sulphate and carbonate are necessary for the agglomeration of the pitch. In fact, this would indicate that the presence of dissolved salts tends to stabilize the suspension and retard its coagulation. The agitation alone would account for part of this coagulation, but the air bubbles introduced by the roll were the main cause, since it was the foam that made the deposit.

A little calcium chloride and sodium carbonate added to this stock in the beater immediately changed the character of the deposit from a pure pitch to a less sticky, white, almost granular curd. It was found to be precipitated calcium carbonate and pitch.

Laboratory Stirrer Results.

The laboratory stirrer, of the type of the malted milk mixer, was found to offer a very good means of testing the tendency of pitch to agglomerate and form a deposit. This means was employed to determine the effect of alum in various concentrations added to the pulp before stirring and also added just after the pitch was added. In the latter case, its effect was less, due to the fact that a portion of the pitch would already be deposited on the stirrer before the alum could take effect. On the other hand, addition of the pitch to pulp which already contained alum allowed complete precipitation of it on the fiber, giving a clear filtrate and a hard sized sheet. Three and one-tenth (3.1) per cent of alum was necessary to give complete precipitation in tap water. The samples tested consisted of 5 grams of pulp in 250 cc. of water, stirred for 2 minutes before and 1 minute after the addition of 5.2 cc. of pitch Solution II.

To determine what effect the presence of alcohol from the pitch solution had on the deposition, a sample, after adding the pitch, was heated to boiling to drive off the alcohol. Subsequent treatment in the stirrer gave less deposition and tackiness than a similar sample which was not boiled. The addition of alum to the boiled sample gave a hard sized sheet, as usual.

Stirring a sample of pulp in N/20 sodium thiosulphate, used to serve as a hardener, gave a somewhat smaller deposit and less tackiness from the pitch added.

The presence of an ordinarily clay filler had no appreciable effect from the standpoint of tackiness, but the addition of 1 per cent of bentonite caused a marked reduction.

The pH of the pulp suspensions in tap water was adjusted by the addition of alum, waste sulphite liquor, and hydrochloric acid to determine the effect of these agents upon the stability of pitch suspensions. After adjusting the pH in each case, the pitch solution was added to the stock in the stirrer, and the rate and character of the resulting deposits were observed. The samples tested were 3.28 grams of unbleached pulp in 200 cc. of tap water with 0.05 grams of pitch added in the form of Solution III. The results are shown in Table VIII.

TABLE VIII
THE EFFECT OF pH ON THE STABILITY OF PITCH SUSPENSIONS

Medium	pH	Remarks
Plain tap water	7.7	Very tacky deposit
Alum	4.7	Very little deposit
HCl	3.2	Slightly better than in plain tap water
Waste SO_2 liquor	4.5	Deposit very small and less firmly held
Waste SO_2 liquor	3.5	Almost no deposit

The alum effect was intermediate between the two waste sulphite liquor effects. The effects were in the same order for the addition of larger amounts of pitch. It is evident from these results that acid conditions alone are not sufficient, but that some stabilizing effect or precipitation on the fiber is also necessary.

3. The Removal of Pitch from the System.

Removal of Pitch by Various Reagents and Methods of Washing.

It is evident from the acid conditions in the digester that the pitchy acids will enter the blow pit in the free acid condition and the peptizing action of the acid waste liquor will be sufficient to form a stable suspension of all the pitch which has been liberated from the fibers. Proper washing methods should, therefore, accomplish the removal of a very large part of the dispersed material, but this is not realized to its fullest extent in practice for three reasons:

(1) After the first draining, the pulp forms an almost perfect medium for filtering off the fine suspended pitch.

(2) The use of cold water for washing causes the pitch to set on the fibers.

(3) As soon as the residual acidity of the liquor is washed out by slightly alkaline wash water, insoluble soaps of the resinous acids are formed with calcium or magnesium from hardness in the wash water or from waste liquor.

These gummy soaps are filtered out on the pulp and are loosely held to the fibers, only to break off and start coagulating in the rifflers, beaters, etc. Suspended pitch particles would be carried along with the soap aggregates, thus increasing the trouble. The fact that river waters have a higher alkalinity in summer would therefore help explain the increased amount of trouble experienced during hot weather.

If, however, the acid peptizing conditions should be maintained throughout the washing process, no opportunity would be given for the formation of the injurious soaps and the pitch would remain in its dispersed state. Furthermore, it was thought that the filtering action of the mat of pulp formed by the first draining could be avoided to a great extent by redispersing the pulp in each volume of fresh wash liquor. The action of redispersing the pulp would tend to brush off any pitch adhering to the fibers and allow it to be washed out.

To investigate the possibilities of this theory, a device for duplicating the washing conditions in the blow pit was constructed by fitting a 77-centimeter section of 41-millimeter glass tubing with a screen at one end, supported by a perforated bronze plate over a 2-hole rubber stopper which carried one tube for a drain and another to admit water so as to facilitate redispersion of the pulp in each volume of fresh wash water. After the first draining, each sample was washed with 5 tubefuls of wash liquor (2 liters) by the same technique, insofar as possible, to obtain comparative results. The data are shown in Table IX. The extraction values were corrected for the amount of pitch in the pulp as determined by running blanks. Except where otherwise indicated, the pulp was redispersed for each wash.

TABLE IX
THE RELATIVE EFFECTIVENESS OF VARIOUS WASHING PROCEDURES FOR REMOVING PITCH FROM PULP

Wash liquor	Per cent removal from tap water suspension	Per cent removal from waste sulphite liquor suspension
(1) Tap water—straight drainage	60.6	70.1
(2) Distilled water—straight drainage	35.4	70.2
(3) Tap water	61.4	...
(4) Tap water—pH to 4.0 with H_2SO_4	51.4	...
(5) Tap water—pH to 4.0 with HCl	37.3	...
(6) Dilute waste liquor	60.4	79.8
(7) Hot tap water	69.9	72.8
(8) 0.1 per cent soda ash	...	66.5
(9) 0.15 per cent Gardinol	77.6	74.1
(10) 0.30 per cent gardinol	...	72.4

It is evident that tap water gives better removal of pitch from the pulp in tap water suspension than does distilled water, probably due to the stabilizing effect of dissolved electrolytes. The fact that washing with tap and distilled water gives the same results in washing pulp originally suspended in waste sulphite liquor as it occurs in the blow pit tends to disprove further the theory that washing with hard water is injurious. The better removal of pitch, in general, from the waste liquor suspensions was attributed to the emulsifying action of this liquor. The value of Gardinol is doubtful, since traces of it left in the stock would cause serious foam trouble. An acid emulsifying agent seems to offer the best results, and a hot dilute solution of waste sulphite liquor should serve effectively in this role.

A similar series of washes were made on samples of pulp from which the hardness had been extracted with hydrochloric acid for the beater test mentioned above. They gave results in agreement with those just listed.

Another series of washes on samples of freshly cooked, unwashed chips from a Mitscherlich mill showed that washing with 0.15 per cent Gardinol left only 0.65 per cent of pitch in the pulp, while the mill washing, including the making of lap pulp, left 1.07 per cent. Redispersing with distilled water, tap water, or dilute waste liquor gave the same value as the lap pulp, while washing by straight drainage with distilled water left a pitch content of 1.23 per cent. Other washing tests were carried out on this material to test the effect of alternating washing by straight drainage and redispersion. This method was less effective than redispersion every time, although by pH measurements the acid was found to be washed out much more rapidly by this procedure.

Fractionation of Pulp.

Fifty (50) grams of balsam Mitscherlich sulphite pulp were disintegrated and fractionated through 20-, 40-, 80-, and 200-mesh screens, and the fines which passed the 200-mesh screen were collected on a cloth. These fractions amounted to approximately 31.5, 10.0, 4.5, 2.9, and 1 grams, respectively. The fines collected by the cloth were dark gray in color and extremely fine. The other fractions, with the exception of the 200-mesh one, were considerably lighter in color than the original pulp. Microscopic examination showed all fractions, except the two of fines, to be almost entirely free from pitch since the ray cells and the dispersed material had been washed on through the coarser screens. This fine material was collected by the 200-mesh screen and the cloth, and the high pitch content of these fractions was evident under the microscope after staining with Sudan III.

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Progress Report of Paper Testing Committee for 1935-6*

By B. W. Scribner, Chairman[1]

The work of the Paper Testing Committee has gone forward during the past year with much the same personnel as before except for two new subcommittees which were formed to deal with water vapor permeability and paper testing instruments. Important advances were made in the various lines of work, and the details follow.

Permeability

P. W. Codwise and his Subcommittee on Water Resistance completed a study of the method proposed by Miss R. M. Cobb at the last annual meeting, for measuring the water resistance of areas of paper and paperboards adjacent to their surfaces. With some modification, the procedure suggested by Miss Cobb was applied by the subcommittee members to duplicate samples of boards and papers, and the results for both heavy and light products are very good. The method should be satisfactory as a standard for this purpose and shall be offered in the near future for vote on adoption as a TAPPI tentative standard.

The Subcommittee on Grease Resistance, H. L. Mellen, Chairman, continued its study of this difficult problem. A further modified procedure was tried by the subcommittee members, with improved results. In this case, also, a proposed tentative method should be available in the near future.

E. S. Worth's Subcommittee on Water Vapor Permeability has made considerable study of the multitude of testing procedures and apparatus that have been proposed for testing this property. Attention has been given particularly to the method proposed by Abrams and Chilson as it appears to be the one most generally favored. In this method, the flow of water vapor through a test specimen sealed to the top of a vessel containing water is measured. It was found that information on some possible additional influences on the test results was necessary before the method could be proposed for trial. Abrams and Brabender have obtained such information and will present it at the meeting of the Technical Annual Association. It is hoped that this information will make possible the formulation of a method standardized sufficiently for round-robin trials.

It is to be regretted that there is still insufficient information on the testing of air permeability, for committee standardization of this important test.

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Waldorf-Astoria Hotel, New York, N. Y., Feb. 17 to 20, 1936.

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Printing Properties

B. L. Wehmoff has obtained some additional information relative to testing the printing properties of papers, but unfortunately, because of his change to another position, it was necessary for him to discontinue this work. Satisfactory progress cannot be made in this direction until means are provided for systematic and extensive research.

Physical Methods

The activities of James d'A. Clark's Subcommittee on Physical Testing comprised methods for thickness, bulk, tensile strength, bursting strength, stretch, dirt, and stiffness. A revision of the standard methods for thickness and bulk was completed for committee vote. The methods for thickness and bulk were combined, and density and specific volume added. The main change in the revised procedure for thickness is reduction in the present large tolerance for the applied pressure, in the interest of better agreement between different laboratories. Mr. Clark has also attempted to improve the accuracy of the tensile and bursting tests, and because the proposed revisions depart considerably from the present standards, they are to be offered for discussion at the annual meeting. The methods for dirt and stiffness described by Clark in published articles are being considered for adoption as suggested methods.

Optical Methods

A tentative revision of the standard method for opacity was adopted by the committee. This corrects some of the errors found in the present standard and permits the use of the photo-electric cell type of insfrument.

J. B. Calkin, Chairman of the Subcommittee on Microscopical Methods, completed a proposed revision of the standard method for fiber composition of paper. This is substantially the same as his article "Microscopical Examination of Paper," which was published in PAPER TRADE JOURNAL, November 29, 1934. It is proposed to include the sections dealing with suggestions on fiber analysis, special stains, and identification of specks and spots, as an appendix to the standard method.

Chemical Methods

Tentative standard methods for soluble iron and arsenic, and a tentative revision of the standard for amount of mineral coating were adopted by the association. Further progress was made by the subcommittee, of which P. F. Wehmer is the chairman. Proposed methods for amount of zinc and titanium pigments, and revisions of the methods for amounts of resin and active sulphur were completed and are ready for vote on adoption. With respect to the method for active sulphur, it was found that it should not be used as an anti-varnish test because indicated active sulphur is sometimes derived from inactive sulphur compounds which would not cause tarnishing of silver and other metals. The revised method is termed "reducible sulphur" with no reference to its use as an anti-tarnish test. For the latter purpose, an actual silver-stain test is being developed. The following additional activities are in progress. The quantitative starch method is being revised to specify saliva as the conversion reagent instead of acid because the latter gives figures that are too high. A new standard, termed "microchemical methods for determination of alpha cellulose, copper number and acidity" is being considered for use when the test sample is very small.

Summary

The work accomplished during the year comprises 2 new methods and 2 revisions adopted by the association, 3 new methods and 5 revisions ready for committee vote on adoption, and 2 new methods and 2 revisions ready for formulation for vote. The members of the subcommittees, who bear most of the burden of the development work, deserve much credit for this record.

Revision of TAPPI Textbook

Members of the committee are assisting in the revision of the paper testing section of The Manufacture of Pulp and Paper, Volume V.

Grinding Pulp With Great Northern Grinders*

By George K. Walker[1]

I was asked by one of your Mechanical Pulping Committee to present a paper at this meeting, covering the operation of the Great Northern Grinders in the Finch, Pruyn Mill at Glens Falls, N. Y., but feeling that it would be difficult to prepare a paper of any length on the operation of one particular grinder, thought it best to give you a few of my personal experiences in grinding pulp with the so called old methods during the past twenty years, as a contrast to the present methods.

Older Practice

For eleven years previous to my first experience running a pulp mill, I had the pleasure of running paper machines in several mills in this country, and one in Greenhithe, England. I believe these mills were fairly representative of the rest of the news mills of that time.

During that period I presume I had as much trouble making paper with poor pulp as the rest, and that was plenty.

In those days when they used enough sulphite and did not ask the groundwood pulpmaker to make very much pulp, we could make paper, but just as soon as they told the groundwood maker to make a little more pulp and only gave him a handful of cast iron sectional burrs to sharpen his stones with, then the paper making troubles began, and the paper production went down, a regular merry-go-round. During my eight years' experience running a pulp and paper mill in Vermont, we had a 140 inch paper machine and eight 3 pocket grinders. For several years in this mill we tried to make pulp by sharpening the stones with No. 6 cast iron sectional burrs applied to the stone with a lever. There were no lathes in those days and the pulp was a combination of slivers and flour.

In 1916 E. M. Hall came out with his Hall Process, and while this process was far from satisfactory, it convinced some of us that there were possibilities of a radical improvement in the methods of making groundwood pulp.

The manufacture of ground wood today is a more scientific process than it was a few years back. As recently as 1933 we had 29 three-pocket grinders operating with eighteen men employed in the grinder room. At this time we were using all natural stones with their consequent inconsistencies regarding hardness and grit and their frequent burring cycles of once each tour. It is a known fact that the more often a stone is sharpened the more variable

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Waldorf-Astoria Hotel, New York, N. Y., February 17 to 20, 1936.

[1] Superintendent, Finch, Pruyn Company, Glens Falls, N. Y.

the strength and freeness of the pulp will be. Both of these features are objectionable to successful manipulation of the grinders, and what is more important, the finished product. With these two variables present, the efficiency of the paper machines presents a serious problem. The operation of these grinders, in regard to temperatures and consistencies was entirely in the hands of the grinder men, and no thought was given to strength as long as the pulp looked satisfactory on the blue glass.

Present Practice

In 1934 we installed eight Great Northern Grinders, and more recently a laboratory, where a study of pulp could be made in conjunction with these units. These grinders are paired into four lines, each line operating with 2400 h.p. The stones are running at 220 r.p.m., controlled by Meyer governors, under a pressure of 52 pounds and manufacturing approximately twenty tons of pulp per day at 55 to 60 h.p. per ton. The grinders are equipped with Taylor temperature controls which eliminate manual supervision. The operating crew for the pulp mill with this set-up of grinders is four men per tour, against the old method of grinding which required eighteen. The time required to change stones is comparable to the old three-pocket type of grinders. The position of the hydraulic lathes at the top of each grinder, lending easy accessibility to burring the stones, is another good feature of these units.

The grinders are equipped with artificial stones, on one grinder we have a Carborundum 56 grit, and the remaining seven stones are four Norton 60 grit, three 50 grit. The present application of burrs to the face of the stones has reduced our stone cost to 6½ cents per ton, and by actual measurements we find our stone wear is approximately 1/16 inch per month. The burring cycle of all the stones, for the last three months operations has averaged 117 hours between sharpenings, against the old method of burring each stone once every eight hours. After burring, the pits and stone surface are always carefully washed to eliminate the grit present.

Since the installation of our laboratory we have made a study of burring cycles, types of burrs, freeness, strength, temperatures and consistencies.

The actual grinding of pulp on these grinders is not much different than other grinders. The quality and quantity of pulp produced is dependent on the type of burr used, and the proper method of using them. This is where the human element enters into the picture, also the blue grass, freeness tester, and sheet making outfit. After sharpening each stone a sample is taken to the laboratory and a sheet made and tested for strength and freeness. When we first began using the sheet making outfit we found after sharpening a stone, we would raise the freeness 50 to 75 per cent, and lower the strength about the same proportion. During the short period of three months we have been able to reduce the spread in the strength of the pulp, before and after sharpening, and in several instances we have been able to sharpen stones without losing any strength, with an increase in production and freeness. This has been accomplished by very close cooperation between the pulpmakers and the operator in the laboratory, and by changing the combination of burrs and the method of using them. We are now using several combinations of burrs such as a No. 2 spiral 1½ inch lead with a No. 12 diamond, a No. 4 spiral with a No. 12 diamond, a No. 4 straight cut with a No. 12 or 16 diamond, depending on the grit of stone and grade of paper being made, and freeness of pulp required.

Our tests have not convinced us that a spiral burr will make stronger or better pulp than a straight cut burr. A spiral burr is easier to apply on these stones as the burr crosses the seams in the stone diagonally and is less liable to chip out the edges of the seams.

It is my personal opinion that we will find that we will get the best results with a No. 2 spiral burr with 1½ inch lead and a No. 12 diamond burr with a Norton stone 6ON a Carborundum 56 running 220 r.p.m. with a pressure of 30 pounds per square inch of grinding surface with temperature from 140 to 160 deg. F. and consistencies of 3.5 to 4 per cent.

From what experience we have to date we believe the temperature and consistency of stock in grinder pit has a large influence on the strength of the pulp.

So far we have confined our effort to making better and stronger pulp with the least amount of power as our power factor is controlled by the amount of water available, which is very small at times.

We expect to be able to make more exhaustive tests in the near future as to the relation of higher speeds and pressure to the strength of the pulp, one test we made with increased speed showed that we lost a little strength and about the same results with increased pressure.

The Rate of Drying of Writing Papers*

By F. W. Adams[1]

Abstract

Drier performance in the production of writing papers has been studied by means of operating data obtained from questionnaires. Production and evaporation rates in drying writings increase with steam temperature. These rates are considerably lower than those previously obtained for other grades of paper and board.

Drier performance is of great interest to the writing paper manufacturer because the properties of the finished sheet are affected to a large extent by the drying process. Desirable qualities such as sizing, finish and strength are developed during drying, but may be completely ruined by improper drying. Furthermore, undesirable properties such as curl and cockle may be prevented or controlled to give a satisfactory sheet or may develop during the same process so that the resulting product is practically valueless as paper.

Data concerning drier performance have been collected and published for board, kraft, and news, indicating what constitutes good, average and poor performance for each of these classifications. This paper covers another phase of the same study and presents data on the drying of hard-sized and writing papers including rag papers, rag content papers and wood pulp papers. Machine speeds varying between 25 and 30 feet per minute were involved in the production of these papers.

The results have been calculated to a uniform basis of

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Waldorf-Astoria Hotel, New York, N. Y., February 17 to 20, 1936.

Contribution of Heat and Power Committee.

[1] Member TAPPI, Asst. Professor, Dept. of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, Mass.

a square foot of total drier surface, using the total circumference of all heated paper drier and felt drier rolls to determine the area of drier surface per inch of machine width. Following the method used previously in reporting drying rates for newsprint, *(1)* "production" is defined as the pounds of paper produced per hour per square foot of total drier surface; "evaporation" is the pounds of water evaporated per hour per square foot of total drier surface. These results are calculated by the following simple formulas.

1. The total drying surface as square feet per inch of width,

$$\frac{s}{w} = 0.0218\ (N_P D_P + N_F D_F)$$

where N_p and D_p represent respectively the number and diameter of heated paper driers and N_F and D_F represent respectively the number and diameter of the felt driers, drier diameters expressed in inches.

2. The production expressed as pounds of paper produced per hour per square foot of drier surface,

$$\text{Production} = \frac{\text{Speed} \times \text{Weight}}{s/w \times 600}$$

where: Speed = Machine speed in feet per minute
Weight = Basis weight—24x36—500.

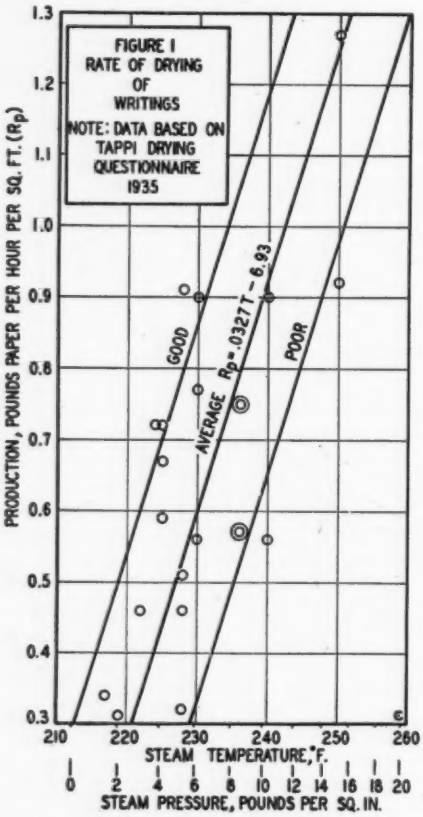
3. The water evaporated per pound of paper dried,

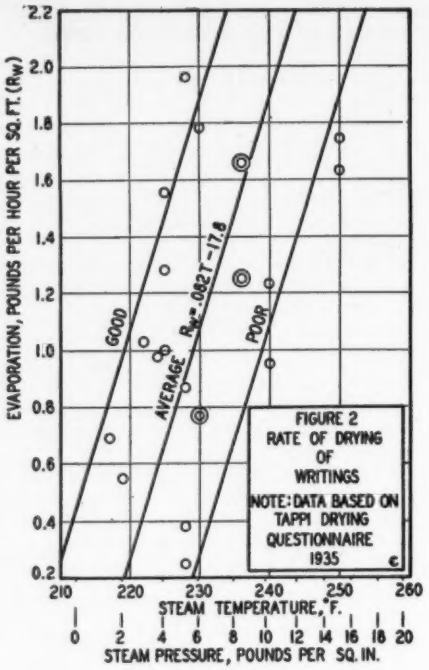
$$W = \frac{A - B}{100 - A}$$

where A = per cent moisture content of the sheet entering the driers
B = per cent moisture content of the sheet leaving the driers

4. The evaporation expressed as pounds of water evaporated per hour per square foot of drier surface,

$$\text{Evaporation} = \text{Production} \times W$$





The results obtained are presented in Figs. 1 and 2, which show the effect of steam temperature on production and evaporation.

The lines marked "average" are representative of the data collected. Arbitrary lines have been drawn above and below the "average" line to indicate "good" and "poor" performance. Those machines operating at higher steam temperatures, due to carrying higher steam pressures in the drier rolls, show a much greater production based on area of drying surface and a larger capacity for evaporating water. It should be borne in mind that the types of paper under consideration require careful treatment to prevent cockle and curl and to develop desired strength and sizing properties. Hence production and evaporation are not entirely a question of removing water at the maximum rate, but are profoundly affected by the shrinkage characteristics of the sheet. These results show in a general way that where higher drying rates are permissible, a large increase in capacity is available with a relatively small increase in steam pressure.

The effect of other operating variables on drier performance is not evident from the data at hand. Machine speed and the area of drying surface per inch of machine width have no effect on either production or evaporation of writing papers. No general effects due to cleanliness of drier surface, drainage conditions in the driers, hoods and special ventilating systems for the machine rooms and felts, felt drier rolls and hydration of the stock are discernible, although in some cases the reason for a point falling in the zone of "poor" or "good" performance is undoubtedly to be found in one of these items.

No detailed comparison of the results on writings with those for other grades is attempted in this paper as it is the intention of the drying committee to assemble the data for all grades in a subsequent publication. Suffice it to say, that production and evaporation rates for writings fall considerably below those for most other grades.

Literature Cited

(1) Adams, F. W., Paper Trade J. 98, No. 1: 38 (Jan. 4, 1934).

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING JUNE 13, 1936

CIGARETTE PAPER

Champagne Paper Corp., *Pipestone County,* St. Nazaire, 539 cs.; H. H. Strauss, *Pipestone County,* Bordeaux, 574 cs.

WALLPAPER

S. K. Lonegren, *Drottningholm,* Gothenburg, 39 bxs.; F. Blank Co., *Manhattan,* Havre, 16 cs.; F. J. Emmerich, *Deutschland,* Hamburg, 4 bls.

PAPER HANGINGS

W. H. S. Lloyd & Co., *American Trader,* London, 2 bls., 2 cs.

PRINTING PAPER

Dingelstedt & Co., *Bremen,* Bremen, 102 cs.; American Express Co., *Bremen,* Bremen, 1cs.

WRAPPING PAPER

Guaranty Trust Co., *Drottningholm,* Gothenburg, 677 rolls.

KRAFT PAPER

F. J. Smidth Co., *Drottningholm,* Gothenburg, 177 rolls.

DRAWING PAPER

H. Reeve Angel & Co., Inc., *American Trader,* London, 2 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., *American Trader,* London, 14 cs.; H. Reeve Angel & Co., Inc., *Aquitania,* Southampton, 5bls., 3 cs.; J. Manheimer, *Aquitania,* Southampton, 89 bls.; C. Schleicher & Schull Co., *Deutschland,* Hamburg, 11 cs.

FILTER COMPOUND

A. W. Fenton, Co., Inc., *Deutschland,* Hamburg, 200 bls.

SURFACE COATED PAPER

Gevaert Co. of America, *Westernland,* Antwerp, 107 cs.; Dingelstedt & Co., *Westernland,* Antwerp, 6 cs.; ———, *Deutschland,* Hamburg, 9 cs.; Globe Shipping Co., *Bremen,* Bremen, 5 cs.

METAL PAPER

K. Pauli Co., *Deutschland,* Hamburg, 5 cs.

BASIC PAPER

Dingelstedt & Co., *Westernland,* Antwerp, 5 cs.; Globe Shipping Co., *Bremen,* Bremen, 2 cs.

PHOTO PAPER

J. J. Gavin, *Aquitania,* Southampton, 6 cs.; ———, *Deutschland,* Hamburg, 2 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., *Samaria,* Liverpool, 16 cs. (duplex)

DECALCOMANIAS

Sellers Transportation Co., *Bremen,* Bremen, 11 cs.; Phoenix Shipping Co., *Bremen,* Bremen, 2 cs.

TISSUE PAPER

W. J. Byrnes, *American Trader,* London, 1 cs.

COLORED PAPER

International F'd'g Co., *Deutschland,* Hamburg, 10 cs.

CORN HUSK PAPER

———, *Black Tern,* Antwerp, 3 cs.

CARD BOARD

F. C. Strype, *Veendam,* Rotterdam, 9 cs., 4 rolls.

MISCELLANEOUS PAPER

The Borregaard Co., Inc., *Drottningholm,* Gothenburg, 189 bls., 920 rolls; D. C. Andrews & Co., *Drottningholm,* Gothenburg, 8 rolls; Guaranty Trust Co., *Drottningholm,* Gothenburg, 474 bdls.; A. Giese & Son, *Ile de France,* Havre, 25 bls.; Almo Trading & Importing Co., *Ile de France,* Havre, 10 cs.; Coty Processing Co., *Ile de France,* Havre, 3 cs.; T. N. Fairbanks, Co., *Exeter,* Genoa, 1 cs.; Moller Products Corp., *Exeter,* Genoa, 13 cs.; Keuffel & Esser Co., *Manhattan,* Hamburg, 113 cs., 63 rolls, 1 crate; ———, *Deutschland,* Hamburg, 665 rolls.

RAGS, BAGGINGS, ETC.

Darmstadt Scott & Courtney, *Aakre,* Barcelona, 35 bls., rags, 76 bls. bagging; A. W. Fenton, Co., Inc., *American Trader,* London, 218 bls. rags; J. Cohen & Sons, Inc., *Samaria,* Liverpool, 22 bls. paper stock; ———, *Samaria* Liverpool, 43 bls. rags; E. J. Keller Co., Inc., *Capulin,* ———, 69 bls. paper stock, 148 bls. bagging; Continental Bank Trust Co., *Black Tern,* Antwerp, 25 bls. bagging; G. W. Millar & Co., Inc., *Black Tern,* Antwerp, 67 bls. rags; D. Galloway, Inc., *Black Tern,* Antwerp, 18 bls. cotton waste; Royal Manfg. Co., *Black Tern,* Antwerp, 44 bls. cotton waste; ———, *Black Tern,* Antwerp, 166 bls. rags, 60 bls. bagging; E. J. Keller Co., Inc., *Black Tern,* ——— 82 bls. paper stock, 194 bls. bagging; Castle & Overton, Inc., *Paraguayo,* Buenos Ayres, 33 bls. old canvas; Castle & Overton, Inc., *Paraguayo,* Buenos Ayres, 243 bls. bagging; Loumar Textile By Products Co., *Veendam,* Rotterdam, 49 bls. bagging; F. Stern, *Veendam,* Rotterdam, 145 bls. rags; ———, *Veendam,* Rotterdam, 50 bls. rags; R. Blank, *Veendam,* Rotterdam, 6 bls. rags; E. J. Keller Co., Inc., *Westernland,* Antwerp, 210 bls. paper stock; Royal Manfg. Co., *Hoegh Carrier,* Kobe, 50 bls. cotton waste; J. J. Ryan & Sons, Inc., *Hoegh Carrier,* Kobe, 50 bls. cotton waste; S. Shapiro & Sons, *Hoegh Carrier,* Kobe, 125 bls. cotton waste;Banco Com'l Italiane Trust Co., *Hoegh Carrier,* Kobe, 30 bls. rags; ———, *Exeter,* Alexandria, 185 bls. rags W. Steck & Co., *Exeter,* Alexandria, 146 bls. bagging Castle & Overton, Inc., *Exeter,* Alexandria, 160 bls. rags; Banco Com'l Italiane Trust Co., *Exeter,* Alexandria, 32 bls. rags, 40 bls. bagging; E. J. Keller Co., Inc., *Exeter,* ———, 302 bls. rags; ———, *Pilsudski,* Gdynia, 68 bls. rags; S. Shapiro & Sons, *Pilsudski,* Gdynia, 73 bls. rags; Darmstadt Scott & Courtney, *City of Flint,* Manchester, 58 bls. old canvas;Darmstadt Scott & Courtney, *City of Flint,* Manchester, 44 bls. cotton waste; E. J. Keller Co., Inc., *City of Flint,* ———, 66 bls. bagging; E. J. Keller Co., Inc., *City of Birmingham,*

———, 65 bls paper stock; Irving Trust Co., *Pipestone County,* Havre, 21 bls. bagging; ———, *Pipestone County,* Havre, 101 bls. rags; R. Blank, *Pipestone County,* Havre, 29 bls. rags; Castle & Overton, Inc., *Pipestone County,* Havre, 7 bls. rags; J. T. Flannery, *Pipestone County,* Havre, 210 bls. rags; J. T. Flannery, *Pipestone County,* St. Nazaire, 47 bls. rags; R. Blank, *Pipestone County,* St. Nazaire, 47 bls. rags; Castle & Overton, Inc., *Pipestone County,* St. Nazaire, 45 bls. rags; Castle & Overton, Inc., *Pipestone County,* Bordeaux, 424 bls. rags; J. T. Flannery, *Pipestone County,* Bordeaux, 48 bls. rags; E. J. Keller Co., Inc., *Pipestone County,* ———, 125 bls. bagging, 47 bls. rags; ———, *Deutschland,* Hamburg, 84 bls. rags.

BONE GLUE

———, *Deutschland,* Hamburg, 400 bags ground bone glue.

OLD ROPE

W. Steck & Co., *Veendam,* Rotterdam, 120 coils.

WOOD PULP

J. Andersen & Co., *Drottningholm,* Gothenburg, 250 bls. sulphite; D. M. Hicks, Inc., *Drottningholm,* Gothenburg, 210 bls. sulphite; Johaneson Wales & Sparre, Inc., *Manhattan,* Hamburg, 313 bls. wood pulp 47 tons; ———, *Manhattan,* Hamburg, 222 bls. wood pulp 23 tons; Castle & Overton, Inc., *Deutschland,* Hamburg, 1000 bls. wood pulp 200 tons; Gottesman & Co., Inc., *Hallaren,* Sweden, 450 bls. wood pulp.

WOOD PULP BOARDS

Fibre Case & Novelty Co., *Drottningholm,* Gothenburg, 11 bls.; H. Fuchs & Son, *Drottningholm,* Gothenburg, 62 crates.

WOOD PULP WADDING

———, *Manhattan,* Hamburg, 164 bls.

NEWARK IMPORTS

WEEK ENDING JUNE 13, 1936

H. G. Craig Co., *Newscarrier,* Donnacona, 331 rolls newsprint.

ALBANY IMPORTS

WEEK ENDING JUNE 13, 1936

Gottesman & Co., Inc., *Boren,* Sweden, 3000 bls. wood pulp; Bulkley Dunton & Co., *Boren,* ———, 1200 bls. wood pulp.

PORTLAND IMPORTS

WEEK ENDING JUNE 13, 1936

Pagel Horton & Co., Inc., *Bessa,* Sweden, 25 tons sulphite; Pagel Horton & Co., Inc., *Bessa,* Sweden 1063 tons sulphite; Gottesman & Co., Inc., *Bessa,* Sweden, 6000 bls. wood pulp; Gottesman & Co., Inc., *Dalhem,* Sweden, 8400 bls. wood pulp; Bulkley Dunton & Co., *Kelkheim,* ———, 250 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING JUNE 13, 1936

———, *Samaria,* Liverpool, 160 bls. hide cuttings; D. C. Andrews & Co., *Samaria,* Liverpool, 5 bls. bowl paper; ———, *Samaria,* Liverpool, 23 bls. rags; G. F. Malcolm, Inc., *Samaria,* Liverpool, 13 cs. tissue paper; ———, *Brynje,* Port Alice, B. C., 2850 bls. sulphite pulp 504 tons; Bulkley Dunton & Co., *Kelkheim,* ———, 3520 bls. wood pulp; E. J. Keller Co., Inc., *Exeter,* ———, 68 bls. paper stock.

PHILADELPHIA IMPORTS

WEEK ENDING JUNE 13, 1936

Castle & Overton, Inc., *Paraguayo,* Buenos Ayres, 37 bls. old garments; Castle & Overton, Inc., *Paraguayo,* Buenos Ayres, 66 bls. old cottons; Chase National Bank, *Hoegh Carrier,* Kobe; 334 bls. rags; ———, *Hoegh Carrier,* Kobe 168 bls. rags; Union Waste Co., *Hoegh Carrier,* Kobe, 60 bls. rags; ———, *City of Flint,* Manchester, 55 bls. cotton waste; E. J. Keller Co., Inc., *Pipestone County,* ———, 1171 bls. rags; Castle & Overton, Inc., *Pipestone County,* St. Nazaire, 294 bls. rags; Castle & Overton, Inc., *Pipestone County,* Bordeaux, 270 bls. rags; American British Chemical Supplies, *Pipestone County,* St. Nazaire, 333 bags casein, 25,017 kilos; Gottesman & Co., Inc., *Schwanheim,* Sweden, 4300 bls. wood pulp.

BALTIMORE IMPORTS

WEEK ENDING JUNE 13, 1936

Pagel Horton & Co., Inc., *Schwanheim,* Sweden, 300 tons sulphate pulp; Pagel Horton & Co., Inc., *Schwanheim,* Sweden, 150 tons sulphite pulp; Gottesman & Co., Inc., *Schwanheim,* Sweden, 3000 bls. wood pulp; Gottesman & Co., Inc., *Consul Corfitzon,* Sweden, 1000 bls. wood pulp; Gottesman & Co., Inc., *Belos,* Sweden, 3500 bls. wood pulp; Bulkley Dunton & Co., *Leerdam,* ———, 470 bls. wood pulp Bulkley Dunton & Co., *Schwanheim,* ———, 5632 bls. wood pulp; Bulkley Dunton & Co., *Karpfanger,* ———, 8550 bls. wood pulp; Bulkley Dunton & Co., *Belos,* ———, 375 bls. wood pulp; Price & Pierce, Ltd., *Consul Corfitzon,* ———, 575 tons unbleached sulphite; Price & Pierce, Ltd., *Consul Corfitzon,* ———, 700 tons unbleached sulphate; E. J. Keller Co., Inc., *Capulin,* ———, 148 bls. bagging; ———, *City of Flint,* Manchester, 9 bls. rags; Congoleum Nairn Co., *Pipestone County,* Havre, 256 bls. rags; Congoleum Nairn Co., *Pipestone County,* St. Nazaire, 165 bls. rags; Congoleum Nairn Co., *Pipestone County,* Bordeaux, 372 bls. rags; ———, *Pipestone County,* Bordeaux, 430 bags casein, 43245 kilos; Parsons & Whittemore, Inc., *City of Hamburg,* ———, 825 bls. wood pulp.

NORFOLK IMPORTS

WEEK ENDING JUNE 13, 1936

N. Y. Trust Co., *Pipestone County,* Havre, 200 bls. bagging.

NEWPORT NEWS IMPORTS

WEEK ENDING JUNE 13, 1936

Bulkley Dunton & Co., *Griesheim,* ———, 4997 bls. wood pulp Bulkley Dunton & Co., *Dalhem,* ———, 4284 bls. wood pulp; Bulkley Dunton & Co., *City of Newport News,* ———, 800 bls. wood pulp.

NEW ORLEANS IMPORTS

WEEK ENDING JUNE 13, 1936

Loumar Textile By Products Co., *Hoegh Carrier,* Kobe, 400 bls. bagging; E. J. Keller Co., Inc., *Arsa,* ———, 509 bls. paper stock.

GALVESTON IMPORTS

WEEK ENDING JUNE 13, 1936

Gottesman & Co., Inc., *Uddeholm,* Sweden, 600 bls. wood pulp.

OAKLAND IMPORTS

WEEK ENDING JUNE 13, 1936

E. J. Keller Co., Inc., *Nebraska,* ———, 399 bls. paper stock.

MONTREAL IMPORTS

WEEK ENDING JUNE 13, 1936

Price & Pierce, Ltd., *Tana,* ———, 1000 tons unbleached sulphate; Price & Pierce, Ltd., *Tana,* ———, 100 tons unbleached sulphite; Gottesman & Co., Inc., *Tana,* Sweden, 26950 bls. wood pulp; Pagel Horton & Co., Inc., *Asgerd,* Sweden, 1600 tons sulphite; Pagel Horton & Co., Inc., *Bjoenn,* Sweden, 900 tons sulphate.

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New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, June 17, 1936.

Demand for the various grades of paper is fairly persistent and conditions in the local paper market compare favorably with the corresponding period of the preceding year. The movement of supplies into consumption is well up to average. Prices are generally holding to previously quoted levels.

The newsprint paper market situation continues to improve. Media Records reports that total advertising linage in newspapers of fifty-two leading cities in May gained 9.8 per cent. from the level of May, 1935. Total linage in these cities in April had improved 8.1 per cent. Taking a long view, the price situation is more favorable.

Steadiness prevails in the fine paper market. Demand for book, cover, bond and ledger papers is fairly active. Prices are holding to schedule, in most instances. Tissues are going forward at a good pace. The coarse paper market is displaying strength, with prices firmer. Some improvement also transpired in the paper board market.

Mechanical Pulp

The ground wood pulp market is irregular. Demand for domestic and Canadian mechanical pulp is listless and prices spotty. Imported ground wood pulp, however, is firmer. Both moist and dry imported mechanical pulp are now quoted at from $24 to $25 per ton, on dock, Atlantic ports. No. 1 domestic and Canadian ground wood pulp are offered at from $27 to $28 per ton, delivered.

Chemical Pulp

Domestic and foreign chemical pulp are exhibiting a stronger undertone. Prices have advanced slightly. Grades in Division 1 are now quoted at from $2.70 to $3.10; Division 2 at from $2.65 to $2.75; and Division 3 at from $2.60 to $2.70. Kraft pulp continues very firm, while other grades of chemical pulp are steady.

Old Rope and Bagging

The old rope market is practically unchanged. Paper mill demand for old manila rope is restricted. Mixed strings are rather quiet. Old rope quotations are fairly steady. No radical changes transpired in the bagging market, which continues dull. Gunny and scrap bagging are moving slowly. Roofing bagging is slightly easier.

Rags

Paper mill demand for domestic rags is only moderately active. New and old cotton rags are in light request, although there is some export interest in No. 1 shirt cuttings. Roofing grades are somewhat easier than of late. The imported rag market reflects the action of the domestic rag market. Prices are nominal, in most instances.

Waste Paper

The position of the paper stock market is considered more satisfactory than of late. Board mill demand for the lower grades is better and quotations on strictly folded news and No. 1 mixed paper are steadier. The higher grades of waste paper are holding up well, including book stock. Old kraft machine compressed bales are firm.

Twine

Although most of the business transacted in the local twine market during the past week was along routine lines, demand for the various varieties is running ahead of last year's record. Prices are generally holding to formerly quoted levels, despite the usual keen competition for desirable orders.

Government Paper Bids and Awards

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 17, 1936—The Paper Corporation of the United States has been awarded the contract for furnishing the Government Printing Office with 36,000 pounds (135,000 sheets) of 38 x 48, 100 per cent rag machine finish book paper at 15.15 cents per pound.

The Old Dominion Paper Company will furnish 80,000 sheets of 22 x 28, 4 ply white railroad board at $16.797 per M sheets. John F. Post, Inc., will furnish 53,700 pounds (175,000 sheets) of double coated book paper at 7.1 cents per pound. The Whiting Paper Company will furnish 66,500 pounds of 25 per cent rag yellow bond paper at 8.9 cents per pound. Bids for all of these items were received on June 1.

The Printing Office has received the following bids for 48,750 pounds (500,000 sheets) of white sulphite writing paper: Baldwin Paper Company, 5.57 cents per pound; R. P. Andrews Paper Company, 5.57 cents; Cauthorne Paper Company, 5.32 cents; John F. Post, Inc. 5.57 cents; Whitaker Paper Company, 5.57 cents; Virginia Paper Company, 5.43 cents; Barton, Duer & Koch Paper Company, 5.43 cents; J. W. Butler Paper Company, 5.33 cents; Paper Corporation of the U. S., 5.33 cents; and Mathers-Lamm Paper Company, 5.32 cents.

I. C. C. Continues Emergency Charges

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 17, 1936—The Interstate Commerce Commission last week announced its decision in the emergency freight surcharge case, authorizing the continuance of the present emergency charges with certain modifications, for an additional period of six months after June 30 next, the date originally fixed for their expiration. No specific mention is made of paper in the decision although some protests were filed with the Commission by paper mills.

The petition of the railroad carriers for permission to continue the charges indefinitely was denied by unanimous vote of the Commission. Commissioners Aitchison, Porter, and Tate dissented from the decision insofar as it authorized any continuance of the charges.

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has the most satisfactory performance record in many of the most modern paper mills in America?

"Buffalo" non-clogging Paper Stock PUMPS—

ask for Bulletin 953

Buffalo Pumps, Inc.

445 Broadway Buffalo, N. Y.

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KILNS, COOLERS, DRYERS, SCRUBBERS, SLAKERS

Are used by many of the greatest chemical and process industries—a fact that paper manufacturers cannot afford to overlook.

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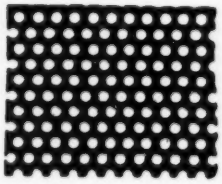
For Pulp and Paper Mills



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Any Metal **Any Perforation**

The Harrington & King PERFORATING Co.

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Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, June 17, 1936.

BLANC FIXE—The position of the blanc fixe market is practically unchanged. Prices are holding to schedule. The pulp is quoted at $42.50 to $45 per ton, in bulk; while the powder is selling at 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—Steadiness prevails in the bleaching powder market. Supplies are moving into consumption in good volume for the season. Prices remain steady and unchanged. Bleaching powder is quoted at $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The casein market continues fairly steady. Domestic standard ground is quoted at 15 and finely ground at 15½ cents; while French and Argentine standard ground are selling at 15¼ cents and finely ground at 15½ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA—Demand for caustic soda is fairly persistent. The contract movement is well up to average for the season. Solid caustic soda is quoted at $2.55 to $2.60; the flake and ground are selling at $2.95 to $3 per 100 pounds, in drums, at works.

CHINA CLAY—The china clay market is exhibiting a strong undertone. Contract shipments are moving freely. Prices are steady. Imported china clay is quoted at $13.50 to $21 per ton, ship side; domestic paper making clay is selling at $6.50 to $12 per ton, at mine.

CHLORINE—Paper mill demand for chlorine is brisk. The contract movement is satisfactory for the time of year. Prices are holding to schedule without difficulty. Chlorine is quoted at $2.15 to $2.55 per 100 pounds, in tank cars, at works.

ROSIN—The rosin market is firmer. Paper making gum rosin is now quoted at $4.60 and wood rosin at $4.50 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent rosin size is selling at $2.60 per 100 pounds, in tank cars, at works.

SALT CAKE—Business in the salt market is fairly active. The contract movement is seasonal. Prices are firm. Salt cake is quoted at $12 to $13; chrome salt cake at $11 to $12 per ton, at works. Imported salt cake is selling at $12 to $13 per ton, ship side.

SODA ASH—The soda ash market is displaying strength. Shipments against contract are moving freely. Prices remain unchanged. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.05; in bags, $1.20; and in barrels, $1.50.

STARCH—Trading in the starch market is mainly routine. Supplies are moving into consumption in fairly good volume. Prices remain unchanged. Special paper making starch is quoted at $3.20 per 100 pounds, in bags; and at $3.47 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA—Demand for sulphate of alumina is well sustained. The contract movement is normal. Prices are steady and unchanged. Commercial grades are quoted at $1.35 to $1.60; and iron free at $2 to $2.25 per 100 pounds, in bags, at works.

SULPHUR—The sulphur market is steady. Yearly contracts are quoted at $18 per ton, in bulk, on orders of 1,000 tons, or over and $20 on smaller quantities. On spot and nearby car loads the quotation is $21 per ton. All quotations are in car lots, at works.

TALC—While the talc market is only moderately active at present the industry is considered in a sound statistical position. Domestic talc is still quoted at $16 to $18 per ton, at eastern mines; while imported talc is selling at $23 to $30 per ton, on dock.

Market Quotations

Paper

Rag Content Bond & Ledgers—Delivered Zone 1

	Bonds	Ledgers
100% Rag Ext. No. 1	.36	.37
100% Rag	.28	.29
75% Rag	.21	.22
65% Rag	.18	.19
50% Rag	.15	.16
25% Rag	.12½	.13½

Sulphite Bond & Ledgers—Delivered Zone 1

	Bonds	Ledgers
No. 1 Sulphite	7.75	8.75
No. 2 Sulphite	6.75	7.75
No. 3 Sulphite	6.00	7.00
No. 4 Sulphite	5.50	6.50

Book, Cased—		
S. & S. C.	5.35 @	5.75
S. & S. C. Litho.	5.60 @	6.00
M. F.	5.10 @	5.50
Coated and Enamel	5.90 @	6.55
Coated Litho	5.90 @	6.55
Tissues—Per Ream—		
White No. 1	.82½ @	—
White No. 1 M. G.	.77½ @	—
White No. 1½	.62½ @	—
White No. 2	.60 @	—
Anti-Tarnish M. G.	.67½ @	—
Colored	.80 @	—
Kraft	.67¼ @	—
Manila	.60 @	—
Unbleached Toilet	2.60 @	3.30
Bleached Toilet	3.94 @	5.26
Paper Towels—		
Unbleached	2.10 @	3.35
Bleached	3.30 @	3.70
Manila—		
No. 1 Jute	9.00 @	9.25
No. 2 Jute	7.75 @	8.50
No. 1 Wood	4.00 @	5.25
No. 2 Wood	3.50 @	4.00
Fibre Papers—		
No. 1 Fibre	4.25 @	5.50
No. 2 Fibre	4.00 @	4.75

(Delivered New York)

News, per ton—		
Roll, contract	41.00 @	—
Sheets	46.00 @	—
Kraft—		
No. 1 Northern	4.25 @	4.75
Standard	4.12½ @	—
Southern	4.00 @	—
Boards—per ton—		
News	32.50 @	35.00
Chip	32.50 @	35.00
Sgl. Mla. Ll. Chip	45.00 @	47.50
Jute Lined Chip	42.50 @	45.00
Kraft Liners	60.00 @	62.50
White Pat. Coated	55.00 @	57.50
Binders Boards	67.00 @	75.00

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—		
Moist	24.00 @	25.00
Dry	24.00 @	25.00
(Delivered)		
No. 1 Domestic and Canadian	27.00 @	28.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—		
Division 1	2.70 @	3.10
Division 2	2.65 @	2.75
Division 3	2.60 @	2.70
Prime Qualities—		
Class 1. All Prime Easy Bleaching	2.05 @	2.10
Other Than Easy Bleaching—		
Class 2. Higher than Standard	2.00 @	2.05
Class 3, Standard	1.95 @	2.00
Class 4. Lower than Standard	1.90 @	1.95
(On Dock, Atlantic Ports)		
Kraft No. 1	1.85 @	2.00
Kraft No. 2	1.70 @	1.80
(F. o. b. Pulp Mill)		
Kraft Domestic	1.80 @	1.90
Kraft Bleached	3.00 @	3.25
(Delivered)		
Soda Bleached	2.60 @	—

* Add 60 Cents per short ton, dock charges, for Albany; $2.00 for Lake Ports East and $3.00 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—		
New White, No. 1.	7.50 @	8.00
Silesias No. 1	5.50 @	5.75
New Unbleached	8.25 @	8.50
New Soft Blacks	3.75 @	4.00
Blue Overall	5.75 @	6.00
Fancy	3.25 @	3.50
Washables	2.25 @	2.50
Mixed Khaki Cuttings	3.50 @	3.75
O. D. Khaki Cuttings	4.25 @	4.50
Men's Corduroy	2.00 @	2.25
New Mixed Blacks	2.75 @	3.00

Old Rags

White, No. 1—		
Repacked	3.00 @	3.50
Miscellaneous	2.75 @	3.25
White, No. 2—		
Repacked	1.75 @	2.25
Miscellaneous	1.50 @	1.75
Thirds and Blues—		
Repacked	2.25 @	2.50
Miscellaneous	2.10 @	2.20
Roofing Rags—		
No. 1	1.80 @	1.85
No. 2	1.40 @	1.45
No. 3 (bagging)	1.30 @	1.35
No. 4	1.30 @	1.35
No. 5A	.90 @	1.00

Foreign Rags

New Rags

New Dark Cuttings	2.25 @	2.50
New Mixed Cuttings	2.00 @	2.25
New Light Silesias	4.50 @	5.00
Light Flannelettes	4.50 @	5.00
New White Cuttings	7.00 @	7.50
New Light Oxfords	4.00 @	4.50
New Light Prints	3.00 @	3.25

Old Rags

No. 1 White Linens	7.50 @	8.00
No. 2 White Linens	6.50 @	7.00
No. 3 White Linens	4.50 @	5.00
No. 4 White Linens	2.25 @	2.50
No. 1 White Cotton	4.25 @	4.75
No. 2 White Cotton	3.25 @	3.75
No. 3 White Cotton	2.50 @	2.75
No. 4 White Cotton	1.90 @	2.15
Extra Light Prints	2.00 @	2.25
Ord. Light Prints	1.75 @	1.85
Med. Light Prints	1.55 @	1.65
Dutch Blue Cottons	2.25 @	2.50
French Blue Linens	3.50 @	4.00
German Blue Linens	2.50 @	2.75
German Blue Cottons	2.00 @	2.25
Checks and Blues	2.00 @	2.25
Linsey Garments	2.15 @	2.25
Dark Cottons	1.90 @	2.10
Old Shopperies	1.75 @	2.00
New Shopperies	1.75 @	2.00
French Blues	2.25 @	2.50

Old Rope and Bagging

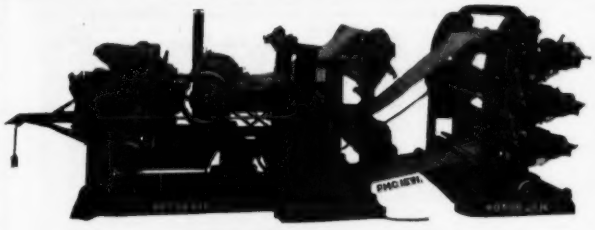
(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—		
Foreign	2.10 @	2.15
Domestic	1.90 @	2.00
Wool Tares, light	1.50 @	1.75
Wool Tares, heavy	1.85 @	2.05
Bright Bagging	1.75 @	1.80
Manila Rope—		
Foreign	2.35 @	2.45
Domestic	2.25 @	2.35
Mixed Strings	1.10 @	1.15
New Burlap Cut	2.50 @	2.75
Hessian Jute Threads—		
Foreign	2.60 @	2.75
Domestic	2.80 @	3.00

Old Waste Papers

(F. o. b. New York)

Shavings—		
White Envelope Cuttings	2.55 @	2.65
Ordinary Hard White No. 1	2.25 @	2.35
Hard White No. 2	2.10 @	2.20
Soft White No. 1	2.05 @	2.15
Flat Stock—		
Stitchless	.65 @	.75
Over issue Mag	.65 @	.75
Solid Flat Book	.55 @	.60
Crumpled No. 1	.35 @	.40
Solid Book Ledger	1.50 @	1.65
Ledger Stock	.85 @	.90
New B. B. Chips	.30 @	.35
Manilas—		
New Env. Cut	1.75 @	1.85
New Cuttings	1.35 @	1.45
Bogus Wrapper	.40 @	.50
Old Kraft Machine—Compressed bales	1.25 @	1.35
News—		
No. 1 White News	1.30 @	1.40
Strictly Overissue	.50 @	.60
Strictly Folded	.25 @	.30
No. 1 Mixed Paper	.20 @	.25



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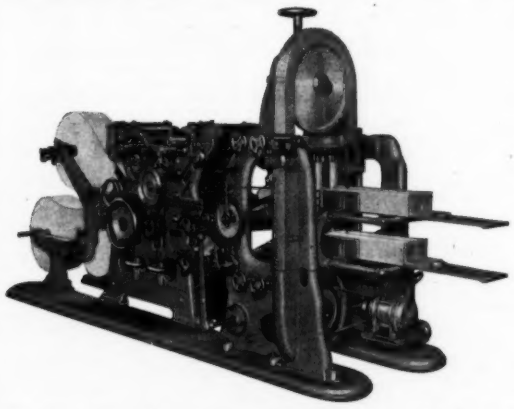

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The model illustrated is a cocktail napkin unit with a rated capacity of 1,000 counted napkins per minute. May be equipped for a product in any standard size or fold.
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Twines

(F. o. b. Mill)

(Soft Fibre)

Coarse Polished—

India	.13¼	@	.15¾
Belg. White Hemp	.14½	@	.17¾
India Compress	.13¾	@	.14¼

Fine Polished—

Fine India	.21½	@	.23½
Special	.19½	@	.21½

Unpolished—

Box	.12	@	.12½
Paper Makers	.09	@	.13½
Tube Rope	.10	@	.15½
Wall Paper	.11	@	.14½
Wrapping	.15½	@	.21
Special	.15	@	.15½
Soft Fiber Rope	.12½	@	.12¾

(Hard Fibre)

Bond	.12	@	.20½
Anchor	.11½	@	.13
Manila	.21	@	.22

CHICAGO

Paper

(F. o. b. Mill)

Rag Bond	.12	@	.40
Water Marked Sulphite Bond	.06¾	@	.11
Sulphite Bond	.05½	@	.07¾
Superfine Writing	.18	@	.24
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07	@	.12
Coated Label	.07	@	.08½
No. 1 Manila	.04¼	@	.05¾
No. 1 Fibre	.04¾	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.03¼	@	.03¾
No. 1 Kraft	4.75	@	5.00
Southern Kraft	3.88	@	4.25
No. 2 Kraft	3.88	@	4.25
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue	.05¾	@	.07
White Tissue	.07	@	.09

(Delivered Central Territory)

News, per ton—			
Rolls, contract	42.00	@	—
Sheets, open	47.00	@	—
Boards, per ton—			
Plain Chip	46.50	@	—
Solid News	50.00	@	—
Manila Lined Chip	55.00	@	—
Patent Coated	65.00	@	—
Container Lined—			
85 Test, per 1000 sq. ft.			1.70
100 Test, per 1000 sq. ft.			1.85

Old Papers

(F. o. b. Chicago)

Shavings—

No. 1 White Envelope Cuttings	1.70	@	2.00
No. 1 Hard White	1.40	@	1.65
No. 1 Soft White	1.25	@	1.50
Ledger & Writings	.60	@	.70
Solid Books	.50	@	.60
Blanks	1.00	@	1.05
Krafts	.80	@	.90
New Kraft Cuts	1.20	@	1.30
Manila Env. Cuts	1.25	@	1.30
Ex. No. 1 Manila	.90	@	1.00
Print Manila	.40	@	.50
Overissue News	.40	@	.45

Old Newspapers—

No. 1 Folded News	.42½	@	.45
No. 1 Mixed Paper	.25	@	.30

Roofing Stocks—

No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper

Rag Content Bond & Ledgers—
Delivered Zone 1

	Bonds	Ledgers
100% Rag Ext. No. 1	.36	.37
100% Rag	.28	.29
75% Rag	.21	.22
65% Rag	.18	.19
50% Rag	.15	.16
25% Rag	.12½	.13½

Sulphite Bond & Ledgers—
Delivered Zone 1

	Bonds	Ledgers
No. 1 Sulphite	7.75	8.75
No. 2 Sulphite	6.75	7.75
No. 3 Sulphite	6.00	7.00
No. 4 Sulphite	5.50	6.50

F.o.b. Mill

Book, M. F.	5.00	@	—
Book, S. S. & C.	5.25	@	—
Book, Coated	6.15	@	—
Coated Lithograph	6.15	@	—
No. 1 Jute Manila	10.50	@	—
Manila Sul., No. 1	6.75	@	—
Manila No. 2	4.25	@	—
No. 1 Kraft	6.00	@	—
Southern Kraft	5.00	@	—
News Print Rolls	40.00	@	—
Straw Board	40.00	@	45.00
News Board	40.00	@	—
Chip Board	37.50	@	—
Wood Pulp Board	70.00	@	85.00
Binder Boards—			
No. 1, per ton	75.00	@	80.00
No. 2, per ton	70.00	@	75.00
Carload lots	65.00	@	70.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.08	@	.08½
New White, No. 2	.04½	@	.05
Light Silesias	.05½	@	—
Silesias, No. 1	.04½	@	.05
Black Silesias, soft	.03½	@	.04
New Unbleached	.06	@	—
Washable, No. 1	.02	@	.02½
Blue Overall	.06	@	.06½
Cottons—According to grades—			
Washable, No. 2	.02½	@	.04½
New Blue	.01¾	@	.02¼
Fancy	.03	@	—
New Black Soft	.04	@	.04½
New Light Seconds	.03½	@	.04
New Dark Seconds	1.75	@	2.00
Khaki Cuttings—			
No. 1 O. D.	.04	@	.04½
No. 2 Mixed	.03½	@	.04
Corduroy	.02	@	.02¼
New Canvas	.04	@	.04½
New Black Mixed	.02	@	.02¼

Domestic Rags (Old)

White No. 1—			
Repacked	4.00	@	4.50
Miscellaneous	3.00	@	3.50
Thirds and Blues—			
Miscellaneous	2.00	@	—
Repacked	2.25	@	2.50
Black Stockings (Export)	4.50	@	5.00
Roofing Stock—			
Foreign No. 1	2.20	@	2.25
Domestic No. 1	1.80	@	1.85
Domestic No. 2	1.60	@	1.65
Roofing bagging	1.30	@	—

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	2.00	@	—
Domestic	2.25	@	—
Manila Rope	2.25	@	2.50
Sisal Rope	2.00	@	2.25
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	2.00	@	2.50
No. 2	.90	@	1.00
Wool Tares, heavy	3.00	@	3.25
Mixed Strings	1.00	@	1.10
No. 1 New Light Burlap	3.00	@	3.50
New Burlap Cuttings	2.50	@	2.75

Old Papers

(F. o. b. Phila.)

Shavings—

No. 1 Hard White	2.30	@	2.40
No. 2 Hard White	2.10	@	2.20
No. 1 Soft White	1.80	@	1.85
No. 2 Soft White	1.40	@	1.45
No. 1 Mixed	—	@	.85
Solid Ledger Stock	1.50	@	1.60
Ledger Stock, white	1.15	@	1.20
Ledger Stock, colored	.85	@	.90
No. 1 Books, heavy	.65	@	.70
Manila Cuttings	1.50	@	1.60
Print Manila	.50	@	.60
Container Manila	.50	@	.60
Kraft Paper	1.10	@	1.20
No. 1 Mixed Paper	.35	@	.40
Straw Board Chip	.40	@	—
Binders Board Chip	.40	@	—
Corrugated Board	.60	@	.65
Overissue News	.60	@	—
Old Newspapers	.40	@	—

BOSTON

Paper

Rag Content Bond & Ledgers—
Delivered Zone 1

	Bonds	Ledgers
100% Rag Ext. No. 1	.36	.37
100% Rag	.28	.29
75% Rag	.21	.22
65% Rag	.18	.19
50% Rag	.15	.16
25% Rag	.12½	.13½

Sulphite Bond & Ledgers—
Delivered Zone 1

	Bonds	Ledgers
No. 1 Sulphite	7.75	8.75
No. 2 Sulphite	6.75	7.75
No. 3 Sulphite	6.00	7.00
No. 4 Sulphite	5.50	6.50

F.o.b. Mill

Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¼	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04¼	@	—
No. 2 Kraft	.04½	@	—

(Delivered New England points)

Southern Kraft	.04	@	—
News Print Rolls	39.50	@	—
Straw Board, rolls	.009	@	35.00
Filled News Board	.40.00	@	45.00
Chip Board	37.50	@	40.00
Single Manila Lined Chip	47.50	@	52.50
Single White, Patent Coated News Board (Bender)	55.00	@	65.00
Wood Pulp Board	70.00	@	75.00
Binder Boards (Standard Grade)	67.00	@	75.00

Old Papers

(F. o. b. Boston)

Shavings—

No. 1 Hard White	2.00	@	2.10
No. 1 Soft White	1.75	@	1.85
No. 2 Mixed	.75	@	.80
Solid Ledger Books	1.50	@	1.75
Overissue Ledger Stock	1.15	@	1.30
Mixed Ledgers	.85	@	.90
No. 1 Books, heavy	.60	@	.70
No. 1 Books, light	.50	@	.60
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.50	@	1.60
No. 1 Old Manila	.60	@	.65
White Blank News	1.20	@	1.25
No. 1 Kraft	1.05	@	1.12½
Mixed Papers	.22½	@	.25
Print Manila	.47½	@	.50
Container Manilas	.27½	@	—
Old Newspapers	.25	@	.27½
Overissue News	—	@	.40
Box Board Chips	—	@	.25
Corrugated Boxes	.35	@	.37½
Kraft corrugated boxes	.90	@	.95
Screening Wrappers	.40	@	.45

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	2.35	@	2.45
Domestic	2.25	@	—
Transmission Rope	1.20	@	1.30
Jute Rope	2.00	@	2.25
Jute Carpet Threads	1.00	@	1.10
Gunny No. 1—			
Foreign	1.90	@	2.00
Domestic	1.80	@	1.90
Bleachery Burlap	4.50	@	5.00
Scrap Burlap—			
Foreign	2.00	@	2.10
Domestic	1.75	@	1.85
Scrap Sisal	1.90	@	2.00
Scrap Sisal for Shredding	2.10	@	2.35
Wool Tares, heavy	1.90	@	2.00
New Burlap Cuttings	2.00	@	2.25
Australian Wool Pouches	2.30	@	2.60
Heavy Baling Bagging	1.95	@	2.00
Paper Mill Bagging	1.75	@	1.85
Bagging No. 2	1.15	@	1.40

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.01¾	@	.02
New White No. 1	.07½	@	.07¾
New White No. 2	.04	@	.04¼
Silesias No. 1	.05	@	.05½
New Black Silesias	.03½	@	.04¼
Soft Unbleached	.07¼	@	.07¾
Blue Cheviot	5.50	@	6.00
Fancy	.02½	@	.02¾
Washable	.0165	@	.0170
Cottons—According to grades—			
Blue Overalls	5.00	@	5.50
New Black, soft	.04	@	.04¼
Khaki Cuttings	.04	@	.04¼
O. D. Khaki	.03¾	@	.04¼
Corduroy	.01¾	@	.02
New Canvas	—	@	.05
B.V.D. Cuttings	—	@	.06¼

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues	1.75	@	2.00
Thirds and Blues			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62½
Black Stockings	3.90	@	4.00
Roofing Stock—			
No. 1	1.80	@	1.90
No. 2	1.40	@	1.50
No. 3	1.20	@	1.25

Foreign Rags

(F. o. b. Boston)

Dark Cottons	1.70	@	1.80
New White Shirt Cuttings	6.50	@	6.75
Dutch Blues	2.25	@	2.50
New Checks & Blues	2.50	@	3.00
Old Fustians	1.85	@	2.00
Old Linsey Garments	1.90	@	2.10
New Silesias	5.25	@	6.00

TORONTO

Paper

(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.11	@	—
No. 2 Sulphite	.08½	@	—
No. 1 Colored	.12	@	—
No. 2 Colored	.09	@	—
Ledgers			
Ledgers, No. 1	.34½	@	—
Ledgers, No. 2	.25½	@	—
Writing	.09	@	.09½
Book—			
No. 1 M. F. (Carloads)	6.50	@	—
No. 2 M. F. (Carloads)	6.00	@	—
No. 3 M. F. (Carloads)	6.00	@	—
No. 1 S. C. (Carloads)	7.00	@	—
No. 2 S. C. (Carloads)	6.50	@	—
No. 3 S. C. (Carloads)	6.50	@	—
No. 1 Coated and Litho	12.00	@	—
No. 2 Coated and Litho	10.50	@	—
No. 3 Coated and Litho	9.50	@	—
Coated tinted	13.00	@	—
Wrapping—delivered—			
Rag Brown	4.75	@	—
White Wrap	3.50	@	—
"B" Manila	4.80	@	—
No. 1 Manila	5.40	@	—
Fiber	5.40	@	—
Kraft, M. F.	5.90	@	—
Kraft, No. 2	5.40	@	—

(F. o. b. Cars Toronto)

News, per ton—			
Rolls (contract)	40.50	@	—
Sheets	45.00	@	—

Pulp

Ground wood	27.00	@	—
Unbleached Sulphite	42.00	@	—
Book (Class 1)	58.00	@	—
Writing (Class 2)	59.00	@	—
Select (Class 3)	60.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.00	@	2.25
Soft White	1.60	@	1.90
White Blk. News	1.25	@	1.40
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	@	1.00
Light and Crumpled Book Stock	.80	@	.90
Ledgers and Writings	1.00	@	1.05
Manilas—			
New Manila Cut	1.25	@	1.40
Printed Manilas	.50	@	—
Kraft	1.00	@	1.60
News and Scrap—			
Strictly Overissue	.55	@	—
Strictly Folded	.50	@	—
No. 1 Mixed Paper	.40	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.07½	@	.07¾
Fancy Shirt Cuttings	.02¾	@	.03

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